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THE BEST BOOK FOR GAT(GENERAL)

Preparation & Practice

(First Edition)

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Ask questions from the book for FREE

WhatsApp: **03208045008**

Preface

The Best Book for GAT (General) – By *Earnest Prep* is a comprehensive preparation guide that includes concept-based lessons in addition to practice questions. Also, the book includes 5 practice tests from past papers, so students can practice actual questions that came in past. The aim of this book is to provide the best possible resource for GAT (General) preparation and practice. The guide consists of three stages:

1) *GAT Beginners Study Plan*
2) *GAT Preparation Plan and*
3) *GAT Practice Session.*

The complete book consists of 20-days study plan. *GAT Beginners Study Plan* starts from Day 1, and ends on Day 3. First 3 days of the study plan contains lessons and practice of basics of GAT quantitative, verbal and analytical sections. Next 12 days of the study plan contains lessons and practice of actual GAT level for all three sections. The *GAT Preparation Plan* starts from Day 4, and ends on Day 15. Finally, next 5 days of the study plan contains 5 full length practice tests, that contain actual practice questions from past papers. *GAT Practice Session* starts on Day 16, and ends on Day 20. Those people who have only 20 days ahead of their GAT (General) test, they can study this book by giving 5 hours daily on average. Those who have more time, they can study flexibly. Following are the top five reasons why you should opt to study from this Book:

1. The Best Book provides *beginners study guide* at beginning for those who are not good in basic math, and basics of logics. Many people from *medical, social sciences* and *arts* are very weak in basic math and logics. So, those people will be able to understand basics and develop basic reasoning skill before starting GAT level preparation.
2. Each lesson provides thorough understanding of different concepts that are tested in GAT (General) test. Those lessons provide very easy methods to learn those concepts, that can be remembered through best practice materials. Note that every book or academy provide some concepts, but fail to build core skills require to get stand out performance in these tests. The Best Book for GAT (General) – by *Earnest Prep* is different from the rest of the books in this aspect. It *builds core skills* by focusing on *thinking* and *reasoning* through emphasizing mental processing rather than hand work on a piece of paper. Human brain can think and process much quicker than a hand.
3. The book includes *20-days study plan*, which covers all three sections (i.e. *quantitative*, *analytical* and *verbal*) on daily basis. If you stick to the plan, you can complete preparation in just 20 days by giving just 5 hours daily.
4. This book also *provides answer explanations* to almost all practice question in assignments. Without answer explanation, your understanding about question solving is on stake. The best part is that, you may ask any question from this book, FREE of charges, via WhatsApp (03208045008) by sending a pic of that question which you unable to solve.
5. At end of preparation, there will *5 full practice tests* from *past papers*. Through these actual GAT level practice tests, you will able to predict your score in your actual GAT (General) test. Some question repeats from these tests. Your actual score in your GAT test will be approximately 15 points more than what you will obtain in these practice tests.

GAT General test types & pattern

Basically, there are four types of GAT (General), namely: GAT A, GAT B, GAT C and GAT D. These types are based on different field of study that students choose in their MS / MPhil program. Each type covers all three section of GAT (i.e. quantitative reasoning, verbal reasoning, and analytical reasoning). But each type includes different proportion to these three sections of GAT (General) test. Following table portrays GAT (General) paper pattern:

Test Types	**Field of Study**	Quantitative Section	Verbal Section	Analytical Section	Total Weightage
GAT A	Business, Engineering & Technology	35%	35%	30%	100%
GAT B	Arts, Humanities & Social Sciences	30%	50%	20%	100%
GAT C	Agriculture & Veterinary Sciences, Biological & Medical Sciences, Physical Sciences	35%	45%	20%	100%
GAT D	Religious Studies (Madrassa Background)	30%	50%	20%	100%

List of Universities require GAT (General) test

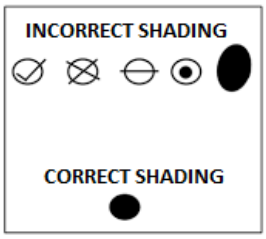
The list of universities keeps changing that require GAT (General) test. In order to see the latest list of universities that require GAT (General) test for admissions in MS / MPhil program, visit the link below:

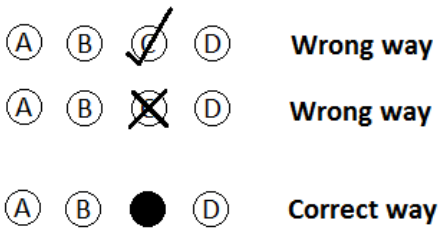
https://gatpreponline.com/list-universities-require-gat/

Additionally, many universities conduct their own test whose test pattern and syllabuses are exactly similar to GAT (General). Moreover, many employment tests also have similar pattern as GAT (General). For instance, State Bank conduct test through NTS for their Young Professional Induction Program. So, this book will help not only for MPhil admissions, but also for securing high paying jobs

Suggestion to fill answer sheet

Always use marker instead of ball point. Encircling the answer sheet is much quick and easier through use of marker (either black or blue). This saves lots of minutes that can be utilize in answering few more questions.





About the Author

The author of this book is *Mubasher Jan* – founder and CEO at Earnest Prep. It is an institute for exams preparation such as: GRE, GMAT, GAT, LSAT, SAT and ACT. Mubasher has tremendous experience of teaching these exams. Based on his experience, he has determined strengths and weaknesses of different types of students and develop this preparation guide accordingly. In his first attempt of GAT(General), he got 92 marks out of 100. Based on his experience, knowledge and caliber in these tests, he published this book and currently publishing some other books so that Pakistani students get *problem solving*, *critical thinking*, *comprehension*, *grammar*, *logics* and *analytical reasoning* skills. These skills are tested in these tests. He has secured 99th percentile rank in all such exams mentioned above except LSAT, which he didn't attempted yet. LSAT syllabus is same as combination of GMAT, and GAT. And it doesn't include quantitative section.

Mubasher has worked with Higher Education Commission of Pakistan (HEC), under the project *US-Pak Knowledge Corridor* for faculty development program to provide GRE preparation training and admission consultancy to get admissions in best ranked universities in USA. Under this project, Mubasher has trained GRE at *University of Azad Jammu & Kashmir*. Additionally, he has trained lecturers and students of *Mehran University of Engineering & Technology*, *University of Sindh*, *ISRA University*, *Liaquat University of Medical & Health Sciences*, and *Shaheed Zulfiqar Ali Bhutto Institute of Science and Technology* at Mehran University arranged by HEC. Additionally, he is conducting the seminars at few universities in Lahore including UET, Lahore. The seminar is relating to PhD admissions in USA with fully funded scholarships. Based on the interest of students and universities administration, Mubasher is conducting 8 weeks comprehensive GRE / GMAT training programs.

Previously, Mubasher has worked in Reach Expo on a project based full time job to facilitate the exports of this country by encouraging companies that have exports potential so they can exhibit their products to international exhibitions and enhance their exports to international markets. Currently, Mubasher is planning to study PhD in Development Economics from USA. After accomplishing his short-run goals, he will apply for PhD straightaway.

About contributors:

There are many contributors who have helped in publishing the book. Names of many people are not mentioned but only major contributors are mentioned below:

Professor Rana Asad Khan has helped in publishing this book for he has good professional experience. Also, he has done PhD from Korea (Hanyang University, Seoul). Previously he has done BS(Hons) and MS from UET, Lahore. Currently he is working as an Assistant Professor at University of Lahore. *Naveed Answer* has also helped in this book publication. He is a lawyer by profession and is currently working as consultant at NESPAK, Lahore. Also, he is providing consultancy services in few law firms related to legal affairs. He is the founder and CEO of Globix, a consultancy firm for legal affairs. *Ishfaque Ahmed* has done his BS and MS from NED university, Karachi. He is currently Lecturer at University of Sindh. He has also contributed in publishing this book.

About Earnest Prep

Earnest Prep is an institute in Lahore – Pakistan, that provides books as well as online preparation courses for test preparation such as GMAT, GRE, GAT, LSAT and SAT etc. Soon, it will initiate preparation classes of these exams in future. Additionally, some international students also preparing through online course for international exams such as GMAT and GRE.

Websites: https://gmatgreprep.com/
https://www.earnestprep.com/
https://gatpreponline.com/

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Table of Content

Only first day is available in pdf. The rest of the study plan is available in the form of book. You can buy the book by following link mentioned in the last page of this free sample booklet.

20 days Study Plan *for* GAT (General)

Day 01

(3 days GAT Study plan *for* beginners)

Before starting GAT (General) test preparation, you must know the basics of GAT (General). In first three days beginners study plan, basic concepts are covered so that you can comfortably start GAT (General) test preparation thereafter from **"The Best Book for GAT (General)"** – *by* ***Earnest Prep*****.** This book includes complete GAT (General) Preparation Guide that consists of **20 days study plan** including first *3 days beginners study guide*, in addition to *12 days preparation plan* and access to *5 Full length practice tests* in practice session at the end. If you can study 5 hours daily, you can complete this book in 20 days, otherwise, you need to study 3 hours daily in order to complete it in a month or so. Below are some other books that will be available very soon:

Contact US: ***Email***: info@earnestprep.com or ***WhatsApp***: (+923208045008)

The following test preparation books will also be available very soon. You may place a request via Email or WhatsApp as mentioned above.

Exam Prep Books by Earnest Prep
The Best Book for **GRE** Preparation – by Earnest Prep
The Best Book for **SAT** Preparation – by Earnest Prep

Basic Quantitative Reasoning

Before going ahead, it is extremely important to read the answers of the following frequently asked questions about GAT *Quantitative Reasoning* section:

Important Frequently Asked Questions

What is tested in GAT Quantitative Reasoning?

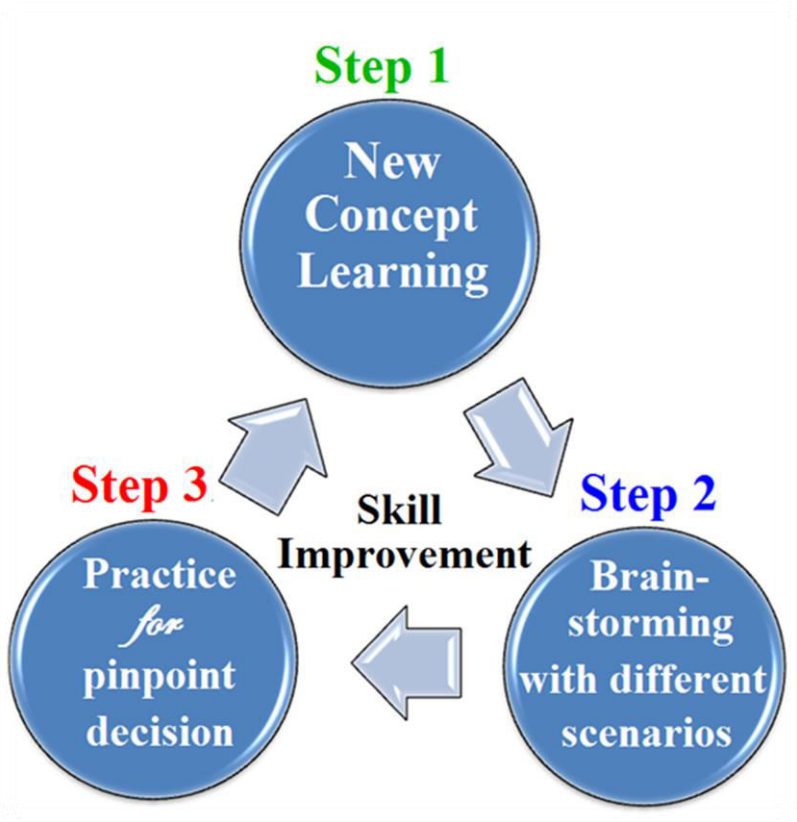
In this section, mare your knowledge of math is not tested. Instead this section grades you on how efficiently you can reason to solve specific scenario of a quantitative problem in such a short span of time. In this section, your brain's work of analyzing & thinking is more critical than your hand work of calculating. This section tests your *Problem-Solving* skill in addition to *Time Management*.

What's the trick to get 99th percentile rank in GAT Quantitative Reasoning Section?

Keep the following important points in mind, that will help you in achieving the target score in this section:

- ⇨ From day 1, make your habit to calculate things in your mind as much as you can, and do only complex calculations through hand. Also, skip as much steps as you can while doing hand calculations.
- ⇨ Never get panic or feel anxious when it takes long time to solve a practice question at beginning. Initially, your objective is to attain *accuracy* rather than to attain *speed*!
- ⇨ At any stage of preparation, always be self-motivated and never loose courage. If quantitative is your weak area, remember that the more time you dedicate to your weakness, the more quickly you make it as your strength!

- ⇨ Do not focus only on practice, rather keep yourself shifting from *Concept Learning* to *Brainstorming* with different scenarios on that concept and from *Brainstorming* to *Quality Practice*. This cycle is shown below, which helps you to learn and improve required sets of skills and helps you to get 99th percentile rank in *Quantitative* section:



- ⇨ When you start getting correct answer of questions from a specific topic (e.g. *percents*), then start feeling sense of urgency and gradually focus on *speed* in addition to *accuracy*.
- ⇨ Whenever you stuck in a hard difficulty level question, and think *"how to solve such a question?"* always keep in your mind that every question is solvable and it takes no more than 2 minutes to solve that question for sure, while using same concept as you would have learned in lessons. At this situation, you need to think out of the box! You will be able to do so after complete preparation and practice from this *The Best Book for GAT (General)* – by *Earnest Prep*.

If you keep these points in mind while studying this book, you will most likely above 90th Percentile rank after complete preparation!

Let's begin study plan for beginners now.

Keep in mind that Quantitative reasoning is not just math. It's more about thinking and reasoning in mind than about solving on piece of paper.

Basic Important Terms & concepts

1. Digits

Digits are the backbone of the whole math. There are total ten digits as mentioned below:

0, 1, 2, 3, 4, 5, 6, 7, 8, and 9

Whenever, you see the word *digit* in a question, it means that it can only be any of the above ten digits. Also, when it is given in a question that *a, b, c, d* and *e* etc. are *distinct* or *different* digits, you should know what are *digits*. Also focus on the word *distinct* or *different*, which means any two of the five digits (i.e. *a, b, c, d* and *e*) cannot supposed to be the same; i.e. all digits must be different. On other hand if words *distinct* or *different* are not mentioned in the question, then any two of the digits CAN be same.

If the sum of two digits is 10, the following possible pairs of digits can do so:

1 + 9 4 + 6

2 + 8 5 + 5

3 + 7

But, if the question states the sum of two *distinct* digits is 10, the last pair (i.e. 5 and 5), as mentioned above, cannot be possible because the two digits must be *different* (i.e. *distinct*). So, be careful while reading such problems.

Additionally, if the question states that the sum of two *even* digits is 10, i.e. the question also states that both of the digits are even*, the following pairs of digits can do so:

2 + 8 4 + 6

*Remember that *even* are those numbers that are divisible by 2 or multiple of 2 (i.e. that comes under table of 2).

Similarly, if the product* of two digits is 10, only the following pair of digits can do so: 2×5

*Remember that *product* means *multiplication* in mathematics.

Note that, product of 10 and 1 is also 10, but the question states that the product of two *digits*, i.e. both numbers must be digits, while 10 is not the digit. So, this pair is not possible answer to the question.

Example scenario: *a* and *b* are distinct digits such that the product of *a* and *b* is 12 and the sum of *a* and *b* is 7, what is the *positive* difference between *a* and *b*?

> Or question may ask, the greater of the two digits is how much greater than the smaller digit? Remember that, both of the statements mean the same thing. We will discuss this later on in this 3-day beginners study guide.

Solution

As it is given that a and b are distinct digits, so both must be amongst ten digits (i.e. 0 – 9), but must be different (as *distinct* means *different*). Also, given that the product of the two digits is 12 i.e.: $a \times b = 12$

Now, think in your mind that which two of the ten digits results to 12 after multiplication?

> You may start from digit 0 and think whether this results to 12 if it multiplies with another digit? You will find no digit. Now, let's consider 1 and think whether this will give result 12 upon multiplying with another digit? Again no! Because the greatest digit is 9, and this gives result 9 upon multiplying with 1. Next, you should consider one digit 2, and think what other digit multiplies with 2 to give 12? The answer is 6! Similarly, by thinking that way in your mind, you will find two pairs that would multiply and give 12.

After brainstorming, you will find two pairs of digits that give 12 upon multiplication. Those pairs are:
(2, 6) (3, 4)

That means, either the two digits are 2 & 6, or they are 3 & 4.

Also, in the question, it is given that the sum of the digits is 7 i.e.: $a + b = 7$

This means that pair must be (3, 4), because only their sum results to 7. Although, we are not sure to say which of the two digits a and b is 4 and which one is 3, but we are certain about the pair (i.e. 3 and 4). Finally, question has asked to find *positive* difference between the two digits.

Hence, positive difference between the two digits = 4 – 3 **= 1** *Answer!*

2. Numbers

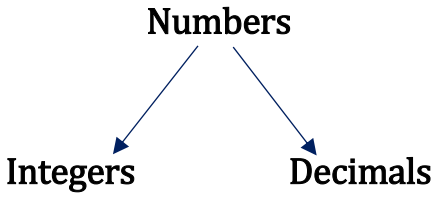
Digits combine to form infinite numbers. For instance:

… –4.8, –4.0, –3.5, –2.0, –1.1, –0.33333, 0, 0.01, 0.5, 0.99, 1.0, 2.09, 3.0, 4.001, …

So, a digit is also a number. And there are infinite numbers. Numbers are of two basic types:

I. *Integers*
II. *Non-integers or decimals*

When it is given in a question that *a, b,* and *c* are numbers, then these could be *integers* or *decimals*.



I. Integers

Numbers that have 0 decimals (i.e. that have no digit, except 0, after the *decimal point*) are integers. For instance:

… –4.0, –3.0, –2.0, –1.0, 0.0, 1.0, 2.0, 3.0, 4.0, …

Or simply

… –4, –3, –2, –1, 0, 1, 2, 3, 4 …

Note that 4.001 is not an integer, because it has 001 in its decimal, that is not 0. Also note that 0 is an integer; and it's an important integer.

There are infinite integers. i.e.:

– ∞, … – 1Billion, … – 1Million, … – 1000, … – 2, – 1, 0, 1, 2, … 1000, … 1Million, …. 1Billion, … ∞

∞ is symbol for infinite, which cannot be defined (i.e. undefined).

Many people argue that infinite and undefined are different things. Technically, both may be different but you should always consider these two as same. This is never tested in skill-based exams. Your test is not about technicalities of math, rather it's about quantitative reasoning skill; i.e. how efficiently you give reason to solve specific problem. In other words, your *problem-solving skill* is tested.

Important Note: *As an integer is a type of number, so all integers are also numbers, but any number may not always be named as integer. For instance, 25 is an integer and also named as a number, but 2.5 (two point five) is a number but it cannot be named as an integer. To understand it clearly, as you know New York is a city of United States. People living in New York are also living in United States; but people living in United States are not necessarily living in New York. THINK LOGICALLY!*

We hope that you will not confuse in these two terms (i.e. *numbers* and *integers*). If in a question, it states that *"a and b are two different numbers such that a is twice as much as ……"*, always believe the following possibilities about *a* and *b*:

I. Both *a* and *b* are integers
II. Both *a* and *b* are decimals
III. *a* is decimal but *b* is integer
IV. *a* is integer, but *b* is decimal.

Do not write these in paper, rather just think these possibilities in your mind. Your brain works much faster than your hand. On other hand, if the question states that *"a and b are two different integers such that a is twice as much as ……"*, always believe only first possibility is true about *a* and *b*.

A *single digit integer* must be of single digit i.e. each of the ten digits as discussed at beginning, is a *single digit integer*. While a *two-digit integer* must be of two digits i.e. it must be of the form of *xy* (e.g. 23, 57, 72, etc.), where *x* and *y* are any of the ten digits, but *x* cannot be 0. Note that, 01, 02, 03 … are not two digit integers. For instance, 10 is the least possible two digit integer. But remember that when its digits are reversed (i.e. 01) it would no longer be a two-digit integer, rather it will become a single digit integer (i.e. 1). Similarly, in case of 20, 30, and 40 etc. all are two digit integers, but when their digits are reversed they would no longer be two digit integers.

Also, note that 99 is the greatest possible two digit integer and 98 is the greatest possible two digit integer having **distinct** digits. Some questions contain statements such as: "*When the digits of a two digit integer are reversed, the resultant integer is 17 greater than the original integer. What is the ……*" Here you should know the definitions of digits and that of integers. This example is advance level scenario, and the purpose of this example is not to learn how to answer this, but to understand what is meant by the question and meaning of each word stated in the question. You cannot solve such problems without knowing the basics. If you understand the question statement properly, the rest is simply arithmetic.

Important Note: *10 is the least possible two-digit integer, whereas 99 is the greatest possible two digit integer and 98 is the greatest possible two digit integers with distinct digits.*

II. Decimals (Non-Integers)

Numbers that have at least one non-zero digit in their *decimal place* are known as decimals.
Decimal place is the place that is on the right side of *decimal point* or *dot* (i.e. ".") in a number. For instance:

… –4.8, –3.5, –2.9, –1.1, –0.33333, 0.00000001, 0.999999, 2.09, 3.222, 4.001, …

Here, 001 is in the decimal place of 4.001 i.e. on the right side of *decimal point*.

Important Note: *There are infinite numbers (of decimals type) between any two adjacent integers (i.e. there are infinite numbers exist between 0 and 1). For instance, 0.1, 0.000000001, 0.00000000000000000000001, 0.00000009, 0.9, 0.99999999 and so on. You cannot count.*

Example Scenario: If the sum of two different positive numbers is 100, what is the maximum possible value of the highest of those numbers?

First think and answer by your own, then go for solution and explanation as stated below. The more you do brainstorming, the more quickly you will learn problem solving skill. This task may feel tedious at beginning, but ultimately, it will be your best friend in helping you to make such things in your figure tips and make you expert!

Solution: Many people will answer 99. But few would answer 99.99. Unfortunately, both answers are incorrect!

The greatest number would be 99.9999999…… and so on, which cannot be determined. In other words, the greatest number less than 100 cannot be determined, because it would be 99.9999999…… and so on. So the answer **cannot be determined** here. Mathematically, it is written as:

$$99.\overline{9}$$

Where the bar at tope of 9 in decimal place means that this digit will repeat infinitely.

You may argue that 99.99 is the approximate value of the highest number less than 100. Actually, you need to give exact value unless it's stated in the question to answer approximately.

Note that there are infinite numbers that are greater than 99, but less than 100. So you cannot determine the greatest number that exist between 99 and 100.

Similarly, if the sum of two different positive numbers is 100, what is the minimum possible value of the smallest of those numbers?

Again, if the least number is required, it is neither 1, nor 01. In fact, it is 0.0000000000000000……1, which **cannot be determined** too.

Key Points

- Digits are the integers from 0 to 9 inclusive.
- Pay close attention to words such as **distinct** or **different** and **positive** or **negative** while reading question wording.
- *Numbers* and *integers* are two **different** things. ***Integers* are a type of *numbers***. Every *integer* is also a *number*, but every *number* is not necessarily an *integer*.
- All *digits* are also *integers*, and all *integers* are also named as *numbers*.
- There are infinite *numbers* exist between any two consecutive (i.e. adjacent) *integers*.

Arithmetic Operations on Integers vs Decimals

Let's apply the four arithmetic operations (i.e. +, –, ×, ÷) in integers and decimals. For that purpose, study the complete below table to understand it:

Comparison	Addition or Subtraction(±)	Multiplication (×)	Division (÷)
integer *vs* integer	integer ± integer = integer	integer × integer = integer	integer ÷ integer = either
integer *vs* decimal	integer ± decimal = decimal	integer × decimal = either	integer ÷ decimal = either
decimal *vs* integer	decimal ± integer = decimal	decimal × integer = either	decimal ÷ integer = decimal
decimal *vs* decimal	decimal ± decimal = either	decimal × decimal = either	decimal ÷ decimal = either

Here, *either* means any of the result is possible (i.e. either *integer* or *decimal*).

Addition or Subtraction: When the two *integers* add or subtract, the result would always be an *integer*. And when one *integer* is added to a *decimal* or subtracted from the *decimal*, the result would always be a *decimal* (i.e. non-integer). Also, when the two numbers are *decimals*, then the result of addition or subtraction would be either an *integer* or a *decimal*.

Multiplication: In division, only when two *integers* multiply the result would always be an *integer*. In all other comparisons, the result would be either an *integer*, a *decimal*.

Division: In division, only when a *decimal* is divided by an *integer*, the result would always be a *decimal*. In all other comparisons, the result would be either an *integer* or a *decimal*.

Types of Integers

On the basis of sign (i.e. + or –), integers are of three types:

I. *Negative integers* (All integers less than zero are negative integers: –1, –2, –3, –4, …)
II. *Neutral integer* (An integer which is neither negative nor positive: Only 0)
III. *Positive integers* (All integers greater than zero are positive integers: 1, 2, 3, 4, …)

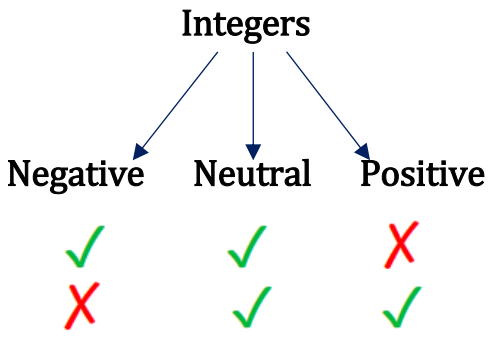
If it is given in question that *a, b* and *c* are positive integers, you cannot assume any of these as 0 or negative. Because 0 is not among positive integers.

Sub-types

Integers are further categorized as:

I. *Non-positive integers* (Integers that are not positive i.e. negative or neutral: 0, –1, –2, –3, –4, …)
II. *Non-negative integers* (Integers that are not negative i.e. positive or neutral: 0, 1, 2, 3, 4, …)

Diagrammatically,



Thus, if it is given in a question that *a, b* and *c* are non-positive integers, you may assume any of these as 0 or negative. Also, if it is given that *a, b* and *c* are non-negative integers, you may assume any of these as 0 or positive.

Important Note: *0 is a non-positive as well as non-negative integer. In other words, 0 is neither a positive nor a negative integer, rather it's the only neutral integer.*

Example Scenario: If *x, y* and z are *non-positive* distinct integers, which of the following MUST be true?

I. $x + y < 0$
II. $xy > 0$
III. $xyz = 0$

A. I only
B. II only
C. I & II
D. I & III
E. All of the above

Important Note: *$a < b$ is mathematical symbol for "a is less than b", and $a > b$ is mathematical symbol for "a is greater than b". So, $x + y < 0$ means sum of x and y is less than 0 (i.e. negative). On other hand $xy > 0$ means product of x and y is greater than 0 (i.e. positive).*

Solution: First of all, you should play more with logics than with simple math. Trust me your brain is a miracle, i.e. you can think, analyze and process logically much faster than you do on a piece of paper. In **The Best book of GAT Preparation** – *by* ***Earnest Prep***, you will be encouraged to think logically more often and use your hand working rarely on piece of paper, while solving every question. The practice of doing this will help you to become expert, so you will able to answer questions without doing lengthy working on a piece of paper and answer in such short span of time.

It is given that *x, y* and z are *non-positive* and *distinct* (i.e. different) integers, so you can only think about 0 or negative integers. Also note that two or more integers cannot be 0 simultaneously, because *x, y* and z are *different* integers. And that's why it is emphasized to pay close attention to each word in the question. So, let's analyze each of the three statements one by one:

Clearly, **statement I** gives negative result, because both of the integers simultaneously cannot be 0, as given that the two integers are distinct (i.e. must be different). The sum of two negative integers or the sum of one negative and 0 is always a negative integer. Thus, this statement **MUST be true**.

Statement II, on other hand, may give result either positive or 0. The reason is that either both *x* and *y* are negative or one of them is 0 while other is negative. This means that product of *x* and *y* could be greater than 0, also the product may equal to 0. Thus, this statement Can be true but **NOT MUST be true** (i.e. not always true)!

Statement III may give result either negative or 0. This is because either all of the three non-positive integers may be negative or one of them may be 0. This means that product of *x, y* and *z* could be equals to 0 or the product may be less than 0. Thus, this statement is also Can be true but **NOT MUST be true** (i.e. not always true)!

Therefore, **choice A is correct**.

Few people may have tried to plug in values to each statement in order to solve. I strongly discourage you to plug in values. Because in several questions including this one, sometimes the statement satisfies the condition (i.e. Statement III gives 0 and sometimes it doesn't give 0 result). If you plugin (0, –1, and –2) values for *x, y* and *z*, the product of *x, y* and *z* would be 0. So, you may wrongly select this statement as Must Be true, which is not the case!

Must be true, Could be true, & Cannot be true

When the question asks any of these, it is vital to know the difference between these three terms. Let's learn this. For that purpose, let's discuss a simple question scenario:

If $x > 3$, which of the following MUST be true, Could be true, and CANNOT be true?

I. $x > 0$
II. $x > 5$
III. $x < 0$

Statement I ($x > 0$): Given that *x* is greater than 3, this means *x* will always be greater than 0. Because any number, which is greater than 3, is always greater than 0 (i.e. positive). *In fact, there's not a single case exists where x could be equal to 0 or less than 0*, so this statement **MUST be true**.

Statement II ($x > 5$): Given that *x* is greater than 3, so *x* can be any number greater than 3. In such situation, I recommend to think extreme possible values (i.e. maximum and minimum). Minimum value of *x* can be 3.000000……1 (Simply the least number/decimal greater than 3), while maximum is infinite. Or, if the question states that *x* is an *integer*, then minimum value of *x* would be 4 in that case. Now given that, if *x* is an integer, it can be 4, 5, 6, 7, 8,…… so *x* CAN be greater than 5, but not always, so it's not MUST be greater than 5. As, *x* can also be equals to or less than 5, so this statement is **COULD be true**, but not MUST be true.

Statement III ($x < 0$): This statement **CANNOT be true**, because given that *x* is greater than 3, which means *x* cannot be negative.

Two important categories of integers

On basis of even and odd classifications, integers can be categories into two types:

1. *Even integers* (Integers that are divisible by 2: 0, ±2, ±4, ±6, ±8, ….)
2. *Odd integers* (Integers that are **NOT** divisible by 2: ±1, ±3, ±5, ±7, ±9, ….)

Important Note: *0 is an even integer, because it is divisible by 2. Many people confuse it while assuming that 0 is neither positive nor negative, thus they wrongly assume that 0 is neither an even nor an odd. In fact, being positive or negative is a different thing and being an even or an odd is a different thing. Every integer must be either an even or an odd. As 0 is an integer, so it must be either even or an odd. As it is divisible by 2, so it must be even.*

Important Note: *Remember that a is divisible by b if and only if a divided by b results to an integer. Mathematically:*

$$\frac{a}{b} = \textit{Integer}\ (\text{i.e. not a } \textit{decimal})$$

We know that when 0 is divided by 2, it gives an integer (i.e. 0). Mathematically, $\frac{0}{2} = 0$

Thus, 0 is an even integer.

So, 0 is divided by 2, it results to 0 (an integer). Therefore, 0 is divisible by 2. We'll learn about this further later on while discussing Factors & Multiples.

Important Note: *Remember that non-integers are not odd, because all odd are those **integers** that are not divisible by 2.*

Important Note: *Even or Odd integers can also be written as Even or Odd numbers, because all integers are numbers. Also, we know that decimals (i.e. non-integers) are neither even nor odd, because both even and odd are integers. Therefore, you'll sometimes see **'even/odd integer'** and sometimes **'even/odd number'** or simply **'even/odd'**. So don't confuse with these terms.*

Arithmetic Operation on Evens & Odds

As discussed above, remember that *Evens* and *Odds* are always integers. Also, Integers are either *Even* or *Odd*. Former statement means when you see the word even, you should believe it as an integer rather than a non-integer. Later statement means each integer is either an *Even* integer or an *Odd* integer. In short, there is no integer, which is neither *Even* nor *Odd*.

Comparison	Addition or Subtraction(±)	Multiplication (×)	Division (÷)
even *vs* even	even ± even = even	even × even = even	E ÷ E = either or decimal
even *vs* odd	even ± odd = odd	even × odd = even	E ÷ O = even or decimal
odd *vs* even	odd ± even = odd	odd × even = even	O ÷ E = decimal
odd *vs* odd	odd ± odd = even	odd × odd = odd	O ÷ O = odd or decimal

Here, decimal means that the result is not an integer (i.e. neither *even* nor *odd*). Also, E = even; O = odd.

Addition or Subtraction: When both of the integers are different (i.e. one is *even* and other is *odd*), the result will always be *odd*. But when both of the integers are same (i.e. either both are *even* or both are *odd*), the result will always be *even*.

Multiplication: When at least one of the integers is *even*, the result will always be *even*. The result would be *odd* only when both of the integers are *odd*.

Division: Only when odd is divided by *even*, the result would be *non-integer* (i.e. neither *even* nor *odd*). In all other cases, the result could be *even* integer, an *odd* integer, or a decimal (i.e. either *an integer or a decimal*).

This basic concept of evens and odds is extremely important. Especially, you should know that when there are several integers multiplying each other, if at least one of the integers is *even*, then the result would always be *even*. For instance, the product of the tree integers *x, y,* and *z* will always be *even*, if at least one of the integers is *even*.

$x \times y \times z$ = Even

For instance, $2 \times 3 \times 5 = 30$ Even

Please, avoid plugin values, just remember this concept. I always discourage for plugin values, but only extreme values to make analysis and solve. The practice of thinking more and doing less through *The Best Book for GAT (General)* – by ***Earnest Prep*** will keep you in track and you will become expert enough to solve many questions without doing any written work.

> Remember that your brain works thousands of times faster than your hand. For instance, if somebody ask you "Can you swim?" You will answer spontaneously and say "YES!" or "NO!". You simply recall what you know about swimming, and your brain start processing and checking whether you have done this before? Based on the record, your brain give output that you respond spontaneously after listening the question. You will not believe that your brain does lots of work but very quickly and helps you to answer spontaneously. In fact, answering this question becomes very normal for you and easy, because your brain is used to answer such things (i.e. you made a habit of involving your brain to do 100% job in such situation). That's why you answer it quickly. You do not make any written stuff. Similarly, if you start practice of thinking more in your brain (i.e. brainstorming) and doing less on piece of paper, your speed

Many people start plugin values in such sort of questions, i.e. they start supposing some values and simply plugin to see which choice will give an odd. But we strongly recommend to avoid plugin as much as you can, because plugin some values gives specific result (i.e. perhaps *odd*), but plugin some different might give a different result (i.e. perhaps *even*). For instance,

Example Scenario: If *a, b* and *c* are consecutive integers*, which of the following MUST be *odd*?

A) $a + b + c$
B) $a + c$
C) ab
D) abc
E) $ab + 1$

*Consecutive integers are the integers that have no integer skipped between them. i.e. 4, 5, and 6 are three consecutive integers.

Solution

Incorrect way: By putting $a = 1$, $b = 2$ and $c = 3$, the sum of *a, b* and *c* would be 6 (i.e. *even*). Is that mean the sum of any three consecutive integers always an *even*? **No!**

For instance, by putting $a = 2$, $b = 3$, and $c = 4$, the sum of the tree consecutive integers becomes 9 (i.e. *odd*).

> That's why we suggest to **avoid plugin** as much as you can, and instead simply **think logically** and remember the relationship of evens and odds as mentioned in the table of arithmetic operations with evens

Correct Way: It is given that *a, b* and *c* are consecutive integers, and we know that for any two consecutive integers, one of them must be even and the other one adjacent to that must be odd. But we cannot tell whether the first of those is even or it's an odd. So, we need to imagine both of the scenarios **in our mind** (i.e. **1.** consider first of the three consecutive integers as even and **2.** consider the first integer as odd) as below:

1) If we consider *a* as *even*, then *b* must be *odd* and *c* must be *even* for *a, b* & *c* are consecutive integers.
2) If we consider *a* as *odd*, then *b* must be *even* and *c* must be *odd* for *a, b* & *c* are consecutive integers.

According to first scenario, $a + b + c$ would be odd, while according to second scenario, the sum would be even. Thus, **Choice A is NOT must be odd**. We are repeating again, please do such things in your mind!

Few of you may argue that this way is bit difficult. But trust me, if you become use to such way, you will be like an expert in quantitative reasoning and able to get full marks in this section. You just need to practice of doing such things in your mind. Enough practice that such things will become in your fingertips.

Similarly, there are two scenarios for Choice B:

1) Both *a* and *c* are even.
2) Both *a* and *c* are odd.

Few people may want to ask why not *a* is *even* and why not *c* is *odd*? Well, this scenario cannot be possible because *a* and *c* are not adjacent integers, rather there is one integer (i.e. *b*) exists between *a* and *c*. This means, if *a* is *even*, then *c* must also be *even* because *b* will be *odd*. And if *a* is *odd* then *c* must also be *odd*, because *b* will be *even*. In short, consecutive integers *a, b* and *c* are either (*even*, *odd*, and *even*) or (*odd*, *even* and *odd*). According to both scenarios, the sum of *a* and *c* always give *even*. Thus, **Choice B CANNOT be odd**.

There's only one possible scenario for third choice, i.e. the product of any two consecutive integer is always an *even*. This is because one of the two consecutive integers (i.e. *a* or *b*) is *even*. So, the product of *a* and *b* would always be *even*. Thus, **Choice C CANNOT be odd**.

Similarly, fourth choice would also result to *even* because three consecutive integers always include at least one *even* integer, so their product would always be *even*. Thus, **Choice D CANNOT be odd**.

Finally, we have left with choice E, which must be the correct answer. Because the product of two consecutive integers (i.e. *ab*) always gives *even*, so *even* + *odd* (i.e. *ab* + 1) is always *odd*. Thus, **Choice E MUST be an odd**.

> Note that the explanation of this technique seems lengthy, while that of plugin method looks as if it is short. But trust me this technique of using brain more than hands is far quicker, authentic and helpful especially in advance level questions. It looks lengthy at beginning because you are not used to do such things in your mind; so, when you will become expert, this technique will be in your fingertips, and you will just see the question and able to answer quickly without doing any paper work. Additionally, chance of getting the correct answer is 100%.

Similarly, let's suppose if *a, b, c* and *d* are consecutive integers, which of the following MUST be *even*?

A) *ac*
B) *bd*
C) *ad*
D) *ab* + *c*
E) *bc* + *d*

> Note that, for instance in Choice A, *a* and *c* multiplying i.e. ac = *a* × *c*

Solution

You need to process your brain bit quickly as you go ahead in this book, but first focus more on accuracy than speed. Let's begin with choice A, and do it a bit faster than as we did previously.

According to the given condition, either (both *a* and *c* are even) or (both *a* and *c* are odd). So, **this choice is NOT Must be even**. Similar with choice B, either (both *b* and *d* are even) or (both *b* and *d* are odd). So, **this choice is NOT Must be even**.

According to the choice C, as we know the product of *a* and *d* is always even (because either *a* must be even or *d* must be even). That means one of these is always be even, and will result to an even. So, **Choice C MUST be even**.

Similarly, the rest of the two choices would not be "MUST be even". For instance, choice D: *ab* must be even, but *c* can be either even or odd. So, result is not MUST be even. Same is the case with choice E.

So far, we have learned basics of numbers, integers, positive integers, negative integers, even and odd integers etc. Additionally, we analyzed how such basic concepts is tested in some actual questions. Now is the best time to learn bit about *arithmetic rules* and its application with practice.

Consecutive Integers

The series of *integers* that has common difference of 1 is called *consecutive integers*. In other words, the series of *integers*, where the difference between any of the two adjacent terms is 1 is called consecutive integers. For instance, n is an integer:

n, n+1, n+2, n+3, ……

This is general form of *consecutive integers*, because in this series of integers, the difference between any two adjacent integers is always remain 1.

Suppose in any question it is given that the sum of 5 *consecutive integers* is 45, and you are asked to find the greatest of those 5 *consecutive integers*. Always use the general form of *consecutive integers* and equate the sum of those 5 *consecutive integers* to the given sum (i.e. 45) as shown below:

$n + n+1 + n+2 + n+3 + n+4 = 45$

Note that the 1st integer is n (i.e. n+0), 2nd integer is n+1, 3rd integer is n+2, and so on…

Thus, the 5th integer would be n+4, rather than n+5.

So, you have: $n + n+1 + n+2 + n+3 + n+4 = 45$

⇨ $5n + 10 = 45$ (Note that variable will add to same variable i.e. all *n's* will be added)

⇨ $5n = 35$

⇨ $n = 7$ (Dividing the previous equation by 5 on both sides)

At this stage, you need to analyze the general form of consecutive integers and see which one of the five integers is greatest? You can see that $n + 4$ is the greatest, so simply put the value of n and get the required answer:

Thus, Greatest integer **=** $n + 4$ = **11** *Answer!*

Similarly, if the smallest integer is required to find, you can say smallest integer among those five integers is n, so in that case the answer would be 7. Also, if the sum of first two integers are required, then simply add n and n+1: i.e. $n + n+1 = 2n+1$

And simply put value of n to get answer accordingly.

Think out of the box: The sum of 12 consecutive integers is 6, what is the least of those integers?

First, try by your own, then go down for explanation. Your brainstorming exercise is extremely important to improve in quantitative reasoning.

Solution

Let's suppose following are the 12 consecutive integers: n, n+1, n+2, n+3, n+4 …… n+11

According to the given condition: $n + n+1 + n+2 + n+3 + n+4$ …… $n+11 = 6$

As you know that all variable (n) will be added, and all integers from 1 to 11 need to be added. All n's will added to give $12n$, but how to add consecutive integers from 1 to 11? Use following way for finding sum of 11 consecutive integers:

$1 + 2 + 3 + 4 + \ldots\ldots + 10 + 11$

$= (1+11) + (2+10) + (3+9) + \ldots\ldots$

Each pair sums to 12. Now, problem arise that how many pairs are there?

Answer is very simple. To understand it, let's think how many pairs of 10 integers will be possible? Clearly half as many (i.e. 5), because every two integer makes one group. That means 10 integers will make 5 groups. But in case of 11 integers, number of groups will remain 5, but one integer would be left alone, and that integer is the middle of these 11 integers as follows:

$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11$

So, Sum = $(12 \times 5) + 6 = 66$ (As there are 5 pairs having sum 12 each and one integer 6 left)

Given that, sum of these 12 consecutive integers (i.e. $n + n+1 + n+2 \ldots\ldots\ldots\ldots n+11$) is 6, so:

⇨ $12n + 66 = 6$

⇨ $12n = -60$ (Subtracting both sides by 66)

⇨ $n = -5$ *Answer!* (Dividing both sides by 12)

Alternate method for those who are good in quantitative reasoning

As mentioned earlier in the book, quantitative reasoning is more about thinking in mind than just math. Some smart people may have tried solving simply in mind and they come up with the same answer, and that is absolutely correct. They use the below reasoning:

It is given that there are 12 consecutive integers, but their sum is 6. But how strange is this. Isn't it?

Yes! In fact, this is not strange, and you should know the consecutive integers doesn't limit us to consecutive positive integers only. So, there must be some negative integers and with same positive integers such that the sum of these negatives and positive would cancel out to 0 except for 6. So, only 6 and 0 would left and rest of all integers will cancel out. This is possible when we add 12 consecutive integers from –5 to 6, such that all positive and negative integers from –5 to 5 would cancel out as follows:

$(-5 + -4 + -3 + -2 + -1 + 0 + 1 + 2 + 3 + 4 + 5) + 6$

$= 0 + 6$

$= 6$

Thus, the least integer will be **– 5**

Key Points

- **Avoid plugin** as much as you can, and **think logically** so you will damn sure on your answer.
- Skip as much steps as you can on paper work, and allow your brain to do the rest of the task.
- The **sum** of two integers will be even if either *both integers are even* or *both integers are odd*.
- The **product** of two or more integers would always be even if at least one integer is even.
- In consecutive integers, use general form and follow the sequence or pattern then solve for n.
- Most of the time, in GAT, you will just need to think logically rather than just do math. This saves plenty of time.

Digit placement in numbers

Digit placement is the place where a digit is placed in a number. In order to understand this, consider the following number *(nine thousand eight hundred seventy-six point five four three)*:

$$9876.543$$

Remember that the placements of the above digits are as follows:

6 → Unit digit
7 → Tens digit
8 → Hundreds digit
9 → Thousands digit
5 → Ten**th** digit
4 → Hundred**th** digit
3 → Thousand**th** digit

Note that '.' is named as *'decimal point'* or simply *'point'*. For instance, 2.5 is spoken as two point five.

Approximation of decimals: You might have studied this concept at high school level. But many of you have learned in wrong way. For instance, while approximating 24.49 to nearest integer, many of you have learned that first you should eliminate 9 on the hundredth digit that will approximate the tenth digit to 5. And this results to 24.5 which can be approximated to 25. This concept is, in fact, wrong!

Always consider all the digits after decimal point combined (e.g. in given case of 24.49 tenth and hundredth digit combined i.e. 49). As it is less than 50, so the nearest integer would remain 24 when we approximate 24.49 to nearest integer. Note that the minimum number that can be approximated to 25 is 24.50 (or simply 24.5).

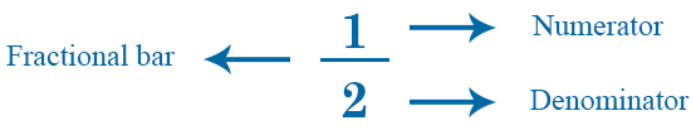
> Few people also confuse and ask that why 24.50 = 24.5? Note that $24.5 \neq 24.05$. You can write as much zeros as you want at right most side of decimal place i.e. 24.50 or 24.5000000. It would not make any difference. But placing 0 to left of a digit at decimal place will change the value. That's the reason why $24.50 \neq 24.05$. In fact, 24.05 is less than 24.50. On other hand, you may write as much zeros as you want to left side of an integer (e.g. 24 = 024 = 0000024), it will not make any difference, but you cannot write zeros on right side of an integer (e.g. $24 \neq 240 \neq 2400000$).

Similarly,
$14.4999 \approx 14$
$14.5000 \approx 15$
$14.5001 \approx 15$

Note that ≈ is a sign for approximation and it is read as *'is approximately equals to'*.

Fractions & Decimals

Fractions are always written in form of $\frac{a}{b}$. Here the integer above the fractional bar (i.e. a) is called the *numerator* and the integer below the fractional bar (i.e. b) called as *denominator*.



$\frac{1}{2}$ is a fraction. Here, 1 is in numerator and 2 is in denominator. As you know that $\frac{1}{2} = 0.5$, so you can say every fraction can be written in decimal form (i.e. 0.5) and vice versa. For instance,

As you know that 2.5 is a decimal, so if you want to write it in fractional form just do the following procedure:

$2.5 = \frac{25}{10}$ (As only one digit is there on right of decimal point, so there will be one zero in denominator, i.e. 10)

$= \frac{5}{2}$

Thus, $\frac{5}{2} = 2.5$ and vice versa.

So, a fraction can be written in decimal form. Similarly, a decimal can also be written in fraction form as follows:

$2.75 = \frac{275}{100}$ (As two digits are there on right of decimal point, so there be two zeros in denominator, i.e. 100)

⇨ $= \frac{11}{4}$ (As $\frac{275}{25} = 11$, and $\frac{100}{25} = 4$; In short, dividing numerator and denominator by 25)

⇨ $\frac{11}{4} = 2.75$ and vice versa.

Note that, $\frac{8}{2} = 4$; so, some fractions result to an integer.

Addition & Subtraction inside Fractional components

In this concept, you will learn what would happen to the original fraction when the numerator and denominator of that fraction is increased or decreased by same number. There are two important scenarios as follows:

i. When numerator is less than denominator
ii. When numerator is greater than denominator

i. When numerator is less than denominator

When numerator is less than denominator, addition of a number to both numerator and denominator will *increase* the value of that fraction. For instance,

You know that $\frac{1}{2}$ equals to 0.5, which is the midpoint of 0 and 1. But, what would happen if we add 3 to numerator as well as to denominator? The answer is that the value of fraction will increase as follows:

$\frac{1+3}{2+3} = \frac{4}{5}$

This resultant fraction $\frac{4}{5}$ is greater than the original fraction i.e. $\frac{1}{2}$

Many students may ask that how would we know $\frac{4}{5}$ is greater than $\frac{1}{2}$?

The answer lies not on calculation but on simple logical thinking. Simply think about adding large integer such as 1000 to both numerator and denominator of $\frac{1}{2}$ as follows:

$\frac{1+1000}{2+1000}$

You don't need to calculate, as you know it results to approximately 1; more specifically a bit less than 1.

Some people may have question whether we can split this expression into the two as given below?

1/2 + 1000/1000

The answer is absolutely NO!

Remember, $(a+b)/(c+d) \neq a/c + b/d$

These things will be discussed in detail later on in advance level study plan in "Algebra"

You can logically conclude that the greater the value you add to both numerator and denominator, the more the result it would give. So, adding 3 to numerator and denominator must increase the value of fraction $\frac{1}{2}$; i.e. $\frac{4}{5}$ is greater than $\frac{1}{2}$. Similarly, we can conclude from above reasoning that if numerator and denominator of $\frac{4}{5}$ is subtracted by same number (i.e. 3), the result will be less than original fraction. For instance,

$\frac{4-3}{5-3} = \frac{1}{2}$

ii. When numerator is greater than denominator

When numerator is greater than denominator, addition of a number to both numerator and denominator will *decrease* the value of that fraction. For instance,

You know that, $\frac{3}{2}$ equals to 1.5, which is the mid-point of 1 and 2. But, what would happen if we add 8 to numerator as well as to denominator? The answer is that the value of fraction will decrease as follows:

$\frac{3+8}{2+8} = \frac{11}{10} = 1.1$

Even you do not need to waste your time in finding value of $\frac{11}{10}$ in decimal form. Simply think about its value in mind, which must be close to 1 and less than 1.5. Thus, the resultant fraction $\frac{11}{10}$ is less than the original fraction i.e. $\frac{3}{2}$. Similarly, you can logically conclude that the greater the value you add to both numerator and denominator, the lesser the result it would give. Thus, adding 8 to numerator and denominator must decrease the value of fraction $\frac{3}{2}$; i.e. $\frac{11}{10}$ is less than $\frac{3}{2}$.

Notice that the two scenarios as discussed above gives reverse result. Gradually, you should start *thinking out of the box*. This habit will be your best friend in advance level study plan and in hard difficulty-level question practices. This is a habit that push you to think if a specific scenario is true, then other knowledge can also be derived and concluded. Here's an example:

Notice that difference between numerator and denominator has remained unchanged after adding or subtracting a number, yet the value tends to change. For instance: in first scenario (i.e. when numerator is less than denominator), the difference between numerator and denominator is 1 in $\frac{1}{2}$. After adding 1000 to both numerator and denominator, the difference remains 1 $\left(\text{i.e. in } \frac{1001}{1002}\right)$; but value of fraction increased. On contrary, in second scenario (i.e. when numerator is greater than denominator) the difference between numerator and denominator has remained 1, but the value of fraction decreased. These trends are extremely important to know, because in hard level questions this *problem-solving skill* is tested quite frequently. At this beginner stage, we will just know the trend of numbers. You must learn how to play with numbers in order to become expert in arithmetic. If you become expert in arithmetic, the whole quantitative section will be in your fingertips!

What is meant by *Think Out of the Box*?

Let's understand this through an example. All of you have studied in some school, where your task was straightforward. Study the course curriculum, learn lessons and take the exam in order to get promoted to next grade or class level. But a graduate student is expected to think beyond simple learning. Graduate student is expected to draw new and further reasoning from available information, so he/she is able to analyze properly and able to make better decision. That's why you learn concept but in exam you attempt questions that require to use those same concepts, but need a bit advance reasoning, i.e. think beyond what

Multiplication & Division inside Fractional components

If you multiply both numerator and denominator by same number, the difference between numerator and denominator will change, but the value of fraction will not change (i.e. neither increase nor decrease). For instance, if we multiply both numerator and denominator of $\frac{5}{2}$ by 2, i.e.:

$$\frac{5 \times 2}{2 \times 2} = \frac{10}{4}$$

Here, value of $\frac{10}{4}$ is same as that of $\frac{5}{2}$.

Similarly, if you divide both numerator and denominator by same number, the value of fraction will not change (i.e. neither increase nor decrease). For instance,

$$\frac{10 \div 2}{4 \div 2} = \frac{{}^{10}/_{2}}{{}^{4}/_{2}} = \frac{5}{2}$$

Again, value of $\frac{5}{2}$ is same as that of $\frac{10}{4}$.

Factors & Multiples

In advance level, you will learn this important topic of arithmetic in detail. But here, you'll just learn about these terms.

Multiples

To understand this term, you must know tables, i.e., tables of 2, tables of 3 etc.

For instance,

Table of 2

$2 \times 0 = \mathbf{0}$

$2 \times 1 = \mathbf{2}$

$2 \times 2 = \mathbf{4}$

$2 \times 3 = \mathbf{6}$

$2 \times 4 = \mathbf{4}$

. . . . .

. . . . .

. . . . .

You see that when 2 multiplies with an integer, it results to another integer (multiple), i.e., in the above table of 2, all resultant boldfaced values (**0**, **2**, **4**, **6**, **8**, ...) that are on the right side of equality sign are multiples of 2.

Similarly,

Table of 3

$3 \times 0 = \mathbf{0}$	$3 \times 4 = \mathbf{12}$
$3 \times 1 = \mathbf{3}$	. . . . .
$3 \times 2 = \mathbf{6}$	. . . . .
$3 \times 3 = \mathbf{9}$	. . . . .

Again, you see that when 3 multiplies with an integer, it results to another integer (multiple), i.e., in the above table of 3, all resultant boldfaced values (**0**, **3**, **6**, **9**, **12**, ...) that are on the right side of equality sign are multiples of 3.

Factors

When an integer is divided by its factor, it always results to another integer. To understand this term, we need to remember the equation given below:

$$\frac{\textbf{Multiple}}{\textbf{Factor}} = \textbf{Integer}$$

For instance, from the above table of 2,

$2 \times 3 = \mathbf{6}$

When 6 is divided by 2, the result is 3, which is an integer.

$\frac{6}{2} = 3$

Therefore, we can say that 2 is a factor of 6.

But, from this point, we cannot infer a reasoning that 2 is the only factor of 6. There are some other factors of 6 also exist. We will discuss this topic in advance level with more difficult and complex scenarios.

Similarly, from the table of 2,

$2 \times 4 = 8$

It means 2 and 4 both are factors of 8, because, when each of them is divided by 8 results to the other integer, i.e. an *integer* resulted rather than a decimal.

Important Note: *When x is a factor of y, then y would always divisible by x. For instance, 2 is a factor of 8, so 8 is divisible by 2. In other words, a multiple (e.g. 8) is always divisible by its factor (e.g. 2).*

'Divisible by' means *'it can be divided by'*; i.e. it will result to an integer rather than decimal when divided. For instance, as you know 8 is divisible by 2, that means when 8 is divided by 2, the result will always be an *integer* (i.e. 4)

Important Note: '0' is a multiple of every integer. And '1' is a factor of every integer. But '0' is not a factor of any integer. Because any integer divided by '0' is not an integer, it's undefined.

Whenever it is asked *"Is x divisible by y?"* you must consider the below equation in your mind:

$$\frac{\textbf{Multiple}}{\textbf{Factor}} = \textbf{Integer}$$

Place *x* as *multiple*, while *y* as *factor* and see whether the result of the division is *integer*? If it is *integer*, then *'x will be divisible by y'*. In other words, *'y is a factor of x'*.

Important Divisibility Rules for an integer

Rule for 2: When the ***last digit*** (i.e. right most digit) of an integer is divisible by 2 (i.e. last digit is even), then that integer is divisible by 2. For instance, 954776 is divisible by 2, because the last digit is even (i.e. 6).

Rule for 3: When the ***sum of all the digits*** of an integer is divisible by 3 (i.e. multiple of 3), then the integer is divisible by 3. For instance, 99774 is divisible by 3, because sum of digits (i.e. 9+9+7+7+4 = 36), is divisible by 3.

Rule for 4: When the ***last two digits*** of an integer is divisible by 4, then that integer is divisible by 4. For instance, 954776 is divisible by 4, because the last two-digits (i.e. 76) is divisible by 4.

Rule for 5: When the last digit of an integer is either 0 or 5, then it is divisible by 5.

Rule for 6: As you know 6 is multiple of both 2 and 3, so when both the rule for 2 and rule for 3 are valid for an integer, then that integer is divisible by 6. For instance, 99774 is divisible by 6 because its last digit is even as well as its sum of digits is divisible by 3.

Rule for 7: There's no as such rule for 7, you need to divide by 7 to check whether an integer divisible by 7.

Rule for 8: When the ***last three digits*** of an integer is divisible by 8, then that integer is divisible by 8. For instance, 954776 is divisible by 8, because the last three-digits (i.e. 776) is divisible by 8.

Rule for 9: When ***sum of all the digits*** of an integer is divisible by 9 (i.e. multiple of 9), then the integer is divisible by 9. For instance, 99774 is divisible by 9, because sum of digits (i.e. 9+9+7+7+4 = 36), is divisible by 9.

Rule for 10: When the last digit of an integer is 0, then that integer is divisible by 10.

Rule for 11: There's no rule for 11 also, you need to divide by 11 to check whether an integer divisible by 11.

Rule for 12: As you know that 12 is multiple of both 4 and 3, so when both the rule for 3 and rule for 4 is valid for an integer, that integer is divisible by12. For instance, 73152 is divisible by 12 because its sum of digits is divisible by 3 (i.e. 7+3+1+5+2) as well as last 2 digits (i.e. 52) is divisible by 4.

Prime Factors

Before understanding this basic concept, you need to know about prime numbers?

Primes

Those positive integers that have exactly two *different* factors are prime numbers.

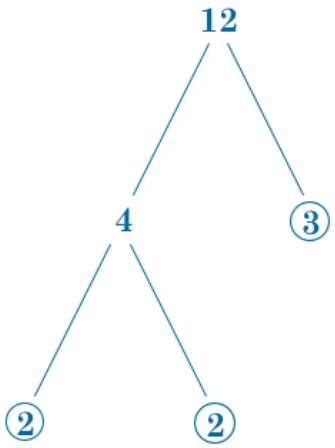
Some people say those integers that can only divisible by 1 and itself are primes. But according to this definition, 1 is also among the integers that divisible by 1 and itself. In fact, ***1 is not a prime***, because it doesn't have *two different* factors. A prime must have two *different* factors. Following are the primes in first 100 positive integers:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 69, 71, 73, 79, 83, 89, 93, 97

Important Note: 2 is the only even prime, while rest of the primes are odd.

Prime Factors: The word *'Prime'* itself indicates these numbers are of high importance like 'Prime Minister' (the highest minister in rank). All positive integers greater than 1 can be broken down to its primes.

For instance,



Therefore, prime factorization of 12 is:

$12 = 2 \times 2 \times 3$

$= \mathbf{2^2 \times 3}$

All prime factors upon multiplication gives that integer which was broken down into its primes.

Important Note: *All positive integers greater than 1 can be broken down into its primes. The example is given above.*

Factor vs Prime factors

Many students confuse with the two terms: *Factors* and *Prime Factors*. You should be clear about the two terms and never mix them.

Factor is an integer which divides its multiple and give a result of integer. For instance,

$\frac{12}{1}$, $\frac{12}{2}$, $\frac{12}{3}$, $\frac{12}{4}$, $\frac{12}{6}$ and $\frac{12}{12}$

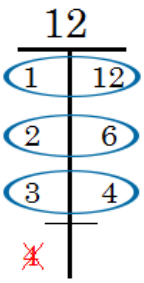
Factors of 12: 1, 2, 3, 4, 6, and 12 itself.

Because when 12 is divided by these, results to an integer.

Important Note: *Every integer is also factor of itself. For instance, 12 is factor of 12, because division of 12 with 12 results to 1 (i.e. an integer).*

T-Method to find total factors

T method is used to find all factors of a specific integer (let's say 12). It is obtained by drawing a large T and above this, writing 12 as shown below:



You can see the pairs of integers whose product is 12. These are total factors of 12. You may obtain this by writing 1 on left side at top as shown above, and think which positive integer results to 12 after multiplying with 1? You will automatically get the other integer 12. And that's first pair (i.e. 1 & 12). Similarly, write 2 below 1 only if 12 is divisible by 2. You know 12 is divisible by 2 (by applying divisibility rules as stated before). Similarly, after writing 2, think about the positive integer which results to 12 after multiplying with 2. As you know 2 times 6 gives 12, thus write 6 as pair of 2 (i.e. 2 & 6). And similarly, 3 is divisible by 12 so write 3 below 2 and look of its pair. You will get (3 & 4). Now STOP!

You cannot move ahead because if you do so, you will get repeated pairs. Thus, there are total six factors of 12 as shown in pairs above. The question arise, how would you know whether you should stop at 3 and don't move ahead to 4 to find its pair? Well for small integers, such as 12, you can quickly judge when to stop. But what about the large integers such as 1000 etc. Well, you should remember that you need to stop till the positive integer which is equivalent to *square root* (or some people name it as *under root*) of 1000. For instance, in case of 12, you should stop to $\sqrt{12} \approx 3.xyz$ (i.e. it gives three point something). Thus, in case of 12, you must be restricted to 3, i.e. when 3 and its pair written down then stop!

Prime factors of 12: 2, 2 and 3 (As we have already solved this before)

Also note,

Unique Prime factors of 12: 2 and 3 (In unique primes, we count repeated primes only once)

Important Note: *Factors and primes factors are very important concepts, whose application will be discussed in details in advance level study plan.*

Least Common Multiple (L.C.M)

In schooling era, you have had learned how to take L.C.M of two different integers. Perhaps, many of you don't know what is L.C.M? First you need to understand this in depth. See below example to understand:

For instance, we need to take L.C.M of 6 & 8. As the word indicate, L.C.M is the least integer that is the multiple of both 6 and 8. So let's see:

Multiples of 6: 6, 12, 18, **24**, 30, 36, 42, **48**, 54, 60, 66, **72**, 78, ……

Multiples of 8: 8, 16, **24**, 32, 40, **48**, 56, 64, **72**, 80, ……

Notice that 24, 48, 72 and many others are the multiples that are common in multiples of 6 and 8. Also, notice that 48, 72 and other common multiples are actually multiples of 24, which is L.C.M.

There are infinite such common multiples of 6 and 8, but the least of these common multiples is 24 and that is known as *Least Common Multiple* (L.C.M).

Think out of the box**:** As it is mentioned before that you should start playing with numbers by analyzing in your own way. From this concept of L.C.M, you must analyze that all multiples of 24 (which is the L.C.M) are common in multiples of 6 and 8. These multiples are underlined above. So, the least multiple which is common in multiples of 6 and 8 is basically the L.C.M of 6 and 8. And, all the multiples of L.C.M would be common in multiples of both 6 and 8. This new point is extremely important and is frequently tested in advance level questions. We'll discuss it in detail in advance level study plan later on.

Going forward, you must learn & use following method to take L.C.M:

Finding L.C.M of two integers

First think in mind that what integer can be taken common from 18 and 24?

You can take several integers common from **(18, 24)** as follows:

First, you can take 2 common from 18 and 24: $(9\times2,\ 12\times2) = 2\ (9,\ 12)$

> As you know that 2 is common factor of both 18 and 24, so let's take this common from both.

Secondly, you can take further 3 common from 9 and 12: $2 \times 3\ (3,\ 4)$

All in all, 6 is the maximum integer which you can take common from 18 and 24: **6 (3, 4)**

Except 1, you cannot take any other integer common from 3 and 4, so that's it!

At this stage, multiply all these integers that are left i.e.: $6 \times 3 \times 4 = 72$

So, the L.C.M of 18 and 24 **= 72** *Answer!*

Although, this method seems a bit hard or lengthy at beginning, but gradually you will able to find L.C.M simply as below:

(18, 24)

6 (3, 4) (Just think the maximum integer which can be taken as common from 18 & 24)

$6 \times 3 \times 4$ **= 72** *Answer!*

Remember that when L.C.M of two integers are required such that one of the integers is the multiple of the other integer, the L.C.M would be that integer which is the multiple of other. For instance,

L.C.M of 6 and 18 is always 18, because 18 is multiple of the other integer 6. So here we don't need to find L.C.M as we already have.

In general, when number *x* is a multiple of number *y*, then the L.C.M of *x* and *y* will be *x*. For instance,

L.C.M of 8 and 24 will be 24, because 24 is the least multiple which is common in multiples of both 8 and 24. So in such cases, you don't need to waste time and simply select the L.C.M quickly.

So, if you see any of the integer to be a multiple of other, just ignore the factor and take the multiple as L.C.M.

More than two integers scenario

Suppose we need to find L.C.M of *a, b, c*, and *d*, and you analyze that *c* is actually the multiple of *a*; then just ignore *a*, and find L.C.M of *b, c*, and *d*.

Finding L.C.M of more than two integers

If the L.C.M of more than two integers are required, always take L.C.Ms in pairs of two integers as below:

Let's suppose, you are required to take L.C.M of 12, 16, 24 and 40

At first, you need to see quickly if any integer is a multiple of the other. Notice that 24 is multiple of 12, so L.C.M of 12 and 24 is 24. So, remove 12 and 24, and simply write their L.C.M with other integers.

At the stage, you have to take L.C.M of 16, 24 and 40.

As it is stated earlier, always take L.C.Ms in pairs, so let's take L.C.M of 16 and 24 as there's no any number among the three that is multiple of any of the other number.

(16, 24)

8 (2, 3) (You can take 4 common as well instead of 8, but as I said take maximum integer common)

$8 \times 2 \times 3 = 48$

So, the L.C.M of 16 and 24 is 48. Finally, take L.C.M of 48 and 40.

(48, 40)

8 (6, 5)

$8 \times 6 \times 5$ **= 240** *Answer!*

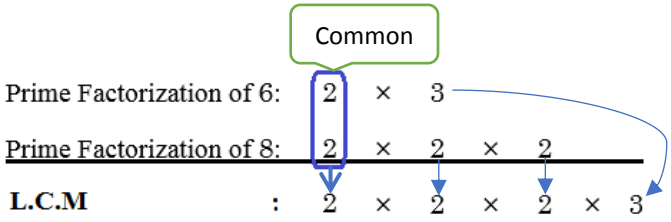
Without using calculator, don't multiply 8 and 6 at first. Rather multiply 6 and 5 and first to ease calculation.

Thus, the L.C.M of 12, 16, 24 and 40 is 240.

L.C.M through Prime Factorization

First, we need to make prime factorization of these two. i.e.:

Now, write down it in an order as figure bellow. Find the common prime factors in prime factorization of 6 & 8. Count this common factor only once rather than twice in L.C.M, while write down remaining primes which are not common.



Finally, multiply all the primes that were brought down. It would give us the L.C.M. So L.C.M of 6 & 8 is:

L.C.M = $2 \times 3 \times 2 \times 2$

= 24 *Answer!*

Remember that when L.C.M of two integers are required such that one of the integers is the multiple of the other, the L.C.M would be that integer which is multiple. For instance, L.C.M of 6 and 18 is always 18, because 18 is multiple of 6. So here we don't need to find L.C.M (i.e. Least Multiple that is common) as we already have it.

Also remember that, when the L.C.M of more than two integers are required, just start solving by considering any two integers and then consider other integers one-by-one. For instance, suppose, we need to find L.C.M of *a*, *b*, and *c*. First take find L.C.M of *a* and *b* (suppose L.C.M is *x* here). After that take L.C.M of *x* and *c*. Thereby you'll get the final L.C.M of *a*, *b*, and *c*. Let's learn scenario of four or more integers, i.e.: *a*, *b*, *c, d.*

First take find L.C.M of *a* and *b*, suppose it's *x*; then, find L.C.M of *c* and *d*, suppose it's *y*. Finally, you may find L.C.M of *x* and *y*, that will be our required L.C.M of *a*, *b*, *c* and *d.*

As mentioned earlier, keep an eye on multiples; i.e. if you see any of the integer to be a multiple of other, just ignore that integer which is not the multiple, because the multiple is the L.C.M. For instance: suppose we need to find L.C.M of *a*, *b*, *c* and *d*. And you analyze that *c* is actually multiple of *a*; then just ignore *a*, and find L.C.M of *b*, *c* and *d*.

Greatest Common Factor (GCF) or Highest Common Factor (HCF)

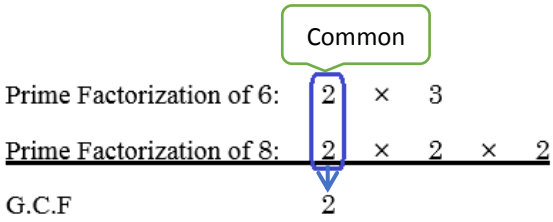
GCF or HCF also involves two or more integers, from which we need to find their G.C.F; e.g., let's find the G.C.F of 6 & 8. The G.C.F of 6 and 8 gives an integer that is greatest factor which is common in 6 & 8. i.e.,

Factors of 6: 1, **2**, 3, and 6

Factors of 8: 1, **2**, 4, and 8

We can see that 2 is the greatest common in factors of both 6 and 8. So the G.C.F of 6 & 8 is 2. Let's have a look below, and find the H.C.F of 6 & 8 through prime factorization,

Now, write down it in an order as figure below and find the common prime factors in prime factorization of 6 & 8. Count this **common factor** only once rather than twice in H.C.F or G.C.F. But don't write down the remaining primes that are not in common in prime factorization of both 6 & 8.



Note that, a prime 2 exists in both 6 and 8, that can be taken out as common, while no other prime can be taken as common.

Therefore, the GCF or H.C.F of 6 & 8 is **2**.

The below method of L.C.M is also useful to quickly find *Highest Common Factor* (H.C.F) or sometimes called as *Greatest Common Factor* (G.C.F). For instance, let's find H.C.F of 48 & 40.

(48, 40)

8 (6, 5)

As 8 is the greatest integer which can possibly be taken as common from 48 and 40, thus **8** is H.C.F of 48 & 40.

Finding H.C.F of more than two integers

Unlike L.C.M that required to take in pairs, H.C.F is not required to take in pairs. You can take H.C.F directly from all available integers. For instance,

If you are required to take H.C.F / G.C.F of 12, 16, 24 and 40, you should think about greatest integer which we can take common among four integers whose H.C.F is required.

(12, 16, 24 and 40)

4 (3, 4, 6, 10)

As 4 is the greatest integer that can be taken as common from all four integers, so H.C.F of those four integers is **4**.

In exam, simply L.C.M or H.C.F will not be asked. As this is beginners study plan, so this will help you to understand advance level preparation plan quickly.

Rationalization

When we solve the following expression for its simplification, this process is known as rationalization. Let's simplify the following expression:

$$\frac{1}{\sqrt{2}-1}$$

As we can multiply as well as divide an expression with same number. So, by multiplying and dividing the above expression with $\sqrt{2}+1$, we'll get:

$$\frac{1}{\sqrt{2}-1} \times \frac{\sqrt{2}+1}{\sqrt{2}+1}$$

$$= \frac{\sqrt{2}+1}{(\sqrt{2}-1)(\sqrt{2}+1)}$$

As we know, $(a + b)(a - b) = a^2 - b^2$, so

$$= \frac{\sqrt{2}+1}{((\sqrt{2})^2-(1)^2)} \qquad (\text{As } (\sqrt{2}-1)(\sqrt{2}+1) = ((\sqrt{2})^2-(1)^2)$$

$$= \frac{\sqrt{2}+1}{(2-1)} = \sqrt{2}+1 \qquad (\text{As we know, } (\sqrt{2})^2 = 2; \text{ and } 1^2 = 1)$$

Thus, $\frac{1}{\sqrt{2}-1} = \sqrt{2}+1$

This process of transferring square root from denominator to numerator, or simply eliminating the square root from the denominator is known as rationalization.

Application of rationalization concept

Rationalization is used in simplifying expressions such as: $\frac{3}{\sqrt{3}}$

By rationalization, we'll get:

$$\Rightarrow \frac{3}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$$

$$\Rightarrow \frac{3\sqrt{3}}{\sqrt{3}\times\sqrt{3}} = \frac{3\sqrt{3}}{(\sqrt{3})^2}$$

Few people may try to cancel out one $\sqrt{3}$ from numerator with one of the $\sqrt{3}$ in denominator. But doing so, you will go back to the original expression. In fact, you need to simplify it i.e. cancel out square root in denominator. So, let's simplify such that the denominator becomes an integer, i.e.,

$$\Rightarrow \frac{3\sqrt{3}}{(\sqrt{3})^2} = \frac{3\sqrt{3}}{3}$$

$$\Rightarrow = \sqrt{3}$$

Thus, $\frac{3}{\sqrt{3}} = \sqrt{3}$

In other words, if in any question, your answer comes out $\frac{3}{\sqrt{3}}$, while the answer choices have no answer like this but has a choice $\sqrt{3}$, then don't be confuse. Basically, your answer will be equivalent to $\sqrt{3}$.

Some Basic Notations

There are some statements in word problems that usually tease test takers while understanding correctly. For instance,

*There are twice as many apples as Mr. **A** has as Mr. **B***

or

*Mr **A** has twice as many applies as Mr **B** has*

Many students confused about this statement, and started time-wasting habit of thinking on whether it would be:

2A = B or A = 2B

You have to be quick in your exam, also have to be accurate. Now, I hope you understood why I've said you that these exams do not test your knowledge, rather these test your decision-making skill. A quick as well as accurate decision-making skill is the potential that universities are seeking in their applicants.

In such situations, you have to be confident while converting these statements into equation. The confidence will push you by simply answering to the pinpoint decision. i.e.

Whatever variable comes after the wording *'as many ... as'*, just multiply that variable with twice or thrice etc. and then equate this to the other variable. In above case, Mr. B come after second *'as'* (i.e. in *'as many ... as'*), so we should multiply B by 2. And equate it with the other variable A. Thus, A = 2B is correct translation. This method will never confuse you. And from onward, you can translate such statements confidently.

Other basic notations

Statement: z is *x* less than *y*.

Solution

z remains **z**

is converted to **=**

x remains ***x***

less than converted to ***–ve sign***

y remains ***y***

So, z *is x less than y*

z = *y* – *x* *Answer!*

Statement

If n is greater than m, the positive difference between twice n and m.

Solution

n greater than m means that positive difference between them is ***n* – *m***

You must be clear about the difference between the two statements as below:

The positive difference between twice n and m. | *Twice the positive difference between n and m.*

The above two statements will give different results. As we are asked the left sided statement, so:

The positive difference between twice n and m

⇨ **2*n* – *m*** *Answer!*

Statement

The ratio of 4q to 7p is 5 to 2.

Solution

Remember that ratio of *a* to *b* = $\frac{a}{b}$

Similarly,

The ratio of 4q to 7p is 5 to 2.

⇨ $= \frac{4q}{7p} = \frac{5}{2}$ *Answer!*

Statement

The product of a decreased by b and twice the sum of a and b.

Solution

Notice on the first part of the statement *'a decreased by b'*. It means the variable a is decreased i.e. something will be subtracted from *a*, rather than from *b*. i.e.

First part of the statement: *a decreased by b*

⇨ $a - b$

Now, the second part also requires careful attention. There is a difference between below two statements:

Twice the sum of a and b. | *Sum of twice a and b*

Second part of the statement: *Twice the sum of a and b.*

⇨ $2(a + b)$

Now, question is asking the product of both parts of the statement. i.e.

Product of ***a decreased by b*** and ***twice the sum of a and b***

⇨ $\boldsymbol{(a - b) \times 2(a + b)}$ *Answer!*

You may further simplify this expression as below:

⇨ $= 2\,(a + b)(a - b) = 2(a^2 - b^2)$ {As we know, $(a + b)(a - b) = a^2 - b^2$}

⇨ $\boldsymbol{2(a^2 - b^2)}$ *Answer!*

Statement

A quarter of the sum of a and b is 4 less than a.

Solution

First part of the statement: *quarter of the sum of a and b*

⇨ $\frac{a+b}{4}$

Remember that *'a quarter'* means one-fourth (i.e. $\frac{1}{4}$). So, a quarter means $\frac{1}{4}$ times or simply divided by 4.

Second part of the statement: *4 less than a*

⇨ $a - 4$

Question states that first part of the statement **is** the second part of the statement. As we know **is** converted to **=**

Therefore,

⇨ $\boldsymbol{\frac{a+b}{4} = a - 4}$ *Answer!*

Basic Analytical Reasoning

Before going ahead, it is extremely important to read the answers of the following frequently asked questions about GAT *Analytical Reasoning* section:

Important Frequently Asked Questions

What is tested in GAT Analytical Reasoning?

This section grades you on how efficiently you can reason to solve logical puzzle based on given sets of conditions (what we call it as *limitations*) in such a short span of time. Sometimes, it is also called group reasoning, where group of information is given and you need to answer based on the given information. If you can accurately extract information in a diagrammatic style, such questions become easier. In this section, your brain's work of *analyzing* & *diagramming / sketching* the information is much more critical. This section tests your *Analytical skill* in addition to *Time Management*.

What's the trick to get 99th percentile rank in GAT Analytical Reasoning Section?

Keep the following important points in mind, this would help you in achieving the target score in this section:

- Read the group information carefully, and draw sketch accurately. Never miss any information in your sketch, as your sketch will tell whether you will answer correctly or incorrectly. In other words, making an accurate sketch is the key to succeed in *GAT Analytical* section.
- Once, sketch is done, never go back to the group information and save as much time as you can from the given sketch, because there's very limited time in your exam, and if you want to complete analytical section within time, you need lot of good practice which is available in *The Best Book for GAT Preparation – by* ***Earnest Prep***.
- In preparation stage, give much time in learning how to make sketch and do plenty of practice. Once you become expert in making accurate sketch, you will become champion in *Analytical Reasoning*.
- Never get panic or feel anxious, when it takes plenty of minutes to solve a question in preparation stage, because you need to practice your brain with such new sort of question types. Once, your brain get habit to deal with such questions, you will able to answer quickly. So, be self-motivated!
- Remember, that once you complete the 20-days study plan as mentioned in this book, analytical reasoning section will become in your fingertips. And you can get 99th percentile rank in analytical section.

You should know the exact meaning of the following questions:

- ✓ Which of the following **Must be true**?
- ✓ Which of the following **Could be true**?
- ✓ Which of the following **Cannot be true**?
- ✓ All of the following **will be true EXCEPT**?
- ✓ All of the following **could be true EXCEPT**?
- ✓ Each of the following **cannot be true EXCEPT**?

Must be true

It is a situation where the given information is always true or there's no any possible situation where the given information is false. In other words, there's 100% chance that the information is true, or there's 0% chance that the given information is false.

To understand this, let's suppose, if X is the father of Y and Z. Then, age of X **must be** greater than age of Y. Also, age of X **must also be** greater than age of Z. But age of X is not must be greater than combined ages of Y and Z.

Could be true

It is a situation, when the given information may possibly be true or there's a possibility that the information may be false. In other words, we are not certain whether the information is true, but there's just some possibility or chance that the information can be true.

To understand this, let's suppose the same example, i.e.: if X is the father of Y and Z. Then, age of X **could be** greater than combined ages of Y and Z. It means there's a possibility that age of X can be greater than the sum of the ages of Y and Z. But this information is not must be true. Also, we cannot say that this information cannot be true, because there's a possibility exist.

Cannot be true

It is a situation where the given information is always false or there's no any possible situation where the given information is true. In other words, there's 100% chance that the information is false, or there's 0% chance that the given information is true. To understand this, let's suppose, if X is the father of Y and Z. Then, age of Y **cannot be** greater than age of X. Also, age of Z **cannot also be** greater than age of X.

Will be true EXCEPT

It means, all of the given choices will always be true, except one choice, which **can be false**. So, the choice which can be false, is correct.

To understand this, let's consider, if X is the father of Y and Z, all of the following will be true EXCEPT the last choice:

A) Age of X is greater than age of Y
B) Age of X is greater than age of Z
C) Combined ages of X and Y is greater than age of Z
D) Combined ages of X and Z is greater than age of Y
E) Height of Z is greater than height of X

Could be true EXCEPT

It means, all of the given choices can be true, except one choice, which **cannot be true**. So, the choice which cannot be true, is correct.

To understand this, let's consider, if X is the father of Y and Z, all of the following can be true EXCEPT the last choice:

A) Both Y and Z are sons of X
B) Both Y and Z are daughters of X
C) Age of Y is greater than age of Z
D) Height of Z is greater than height of X
E) Age of Y is greater than age of X

Cannot be true EXCEPT

It means, all of the given choices are false, except one choice, which **can be true**. So, the choice which can be true, is correct.

To understand this, let's consider, if X is the father of Y and Z, all of the following cannot be true EXCEPT the last choice:

A) Age of Y is greater than age of X
B) Age of Z is greater than age of X
C) X has no child
D) X, Y and Z are siblings
E) X is having least height among X, Y and Z

GAT Analytical questions are presented in groups of three to seven questions. Each group is based on a short passage followed by a set of conditions. There are some basic strategies that would help you in solving *GAT Analytical Reasoning* questions at beginner stage.

Basic Strategies

- Always count the number of questions that each group has; and start from the group that contains largest number of questions. It'll be a loss when you give huge time to that group that contains only few questions.
- Utilize maximum one and a half minutes per question on average. i.e., if there are 4 questions in a group, spend no more than 6 minutes to this group. If a question left after 6 minutes over, then take a minute more, otherwise if more than one questions still left; just move on to next group and avoid further waste of time, because next group may be relatively easier for you.
- Always draw intelligent drawing (i.e., shape the information of the group in picture form) of each group while reading the passage containing information. There's no hard and fast rule for drawing these. Everybody has his own way of solving the questions and create different drawing at the spot.
- Make changes in the drawing accordingly with the additional information that are subject to limitations in the group question. And let's call it as your original drawing.
- When the drawing finalizes according to all information of group, then move on the first question of the group and change the drawing according to the question, if necessary. And answer the first question, while using the drawing.
- While solving the next question, always revert back to the original drawing rather than the drawing used in first question after changes. And similarly, while solving 3rd and 4th questions use the original drawing to find the answer.

Important Note: *If you successfully answered the first question from the group having several questions and proceeded to answer the second one, just forget about the information given in the first question; just consult the information in the passage including conditions. Similarly, if you answered the second question of the group of several questions and proceeded to the third one, just forget about the information given in first and second questions of the group; again, consult the information in the passage of the group together with the conditions.*

To understand the general format of the question, consider the following simple example scenario at this beginners stage. In advance level, we'll discuss actual questions scenarios with medium and hard difficulty levels questions with according strategies. After covering that complete, you will become expert in analytical reasoning section.

Basic Analytical Reasoning example scenario

Answer Question 1 – 4 based on information below

Five people (namely: A, B, C, D, and E) took GAT exam, and were ranked according to the given condition:

Mr. A was amongst top Three in the exam.
Mr. B was on Fourth rank.
C was on the adjacent rank next to E.

1. Which of the following MUST be on the last rank?
   a) Mr. A
   b) Mr. B
   c) Mr. C
   d) Mr. D
   e) Mr. E

2. Which of the following MUST be on the first rank, if B was on next adjacent rank next to A?
   a) Mr. A
   b) Mr. B
   c) Mr. C
   d) Mr. D
   e) Mr. E

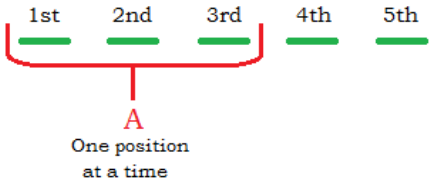
3. All of the following could be the true ranking of persons from top to bottom EXCEPT?
   a) A, E, C, B, D
   b) E, C, A, B, D
   c) E, A, C, B, D

4. How many possible arrangements of ranking of five persons can be made?
   a) 0
   b) 1
   c) 2
   d) 3
   e) 4

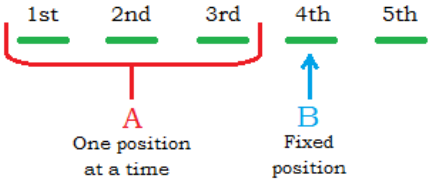
Answers Explanations

To answer these questions, always make arrangements according to the conditions given in question. i.e.:

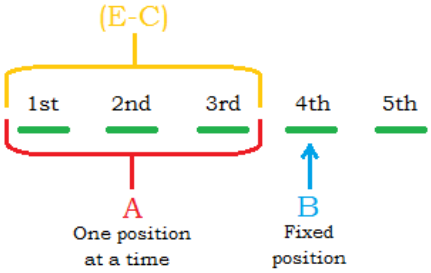
- First condition (i.e. first restriction / limitation) tells information about the possible positions of **A**, who may only be placed on first three positions as shown below:



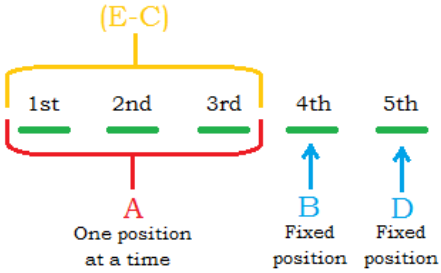
- Second condition (or restriction) tells information about the position of **B**, which must be placed at fourth position/rank, i.e. fixed at fourth rank, so let's sketch it:



- Third and final condition tells information about the places of **C** and **E**, that must be place on adjacent places, i.e., place side-by-side; such that **C** must place after **E** place. The word *"next to"* suggests that **C** must place just after the rank of **E**, i.e., not before **E**. Because both have to be place together, so neither **C** nor **D** can place at 5th position/rank and, therefore, can be placed at first three positions, as shown below:



Finally, one person **D** is left with only a position of 5th; so it must be fixed on this position, as shown below:



Based on the given information, the above sketch is our final sketch, and we will not go back to the question for group information, rather we will consult with this final version of our sketch to answer all questions.

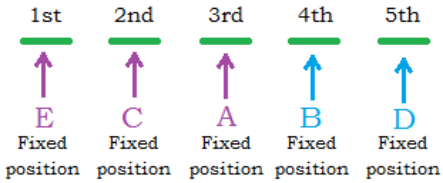
Now, let's answer each question one by one after making diagrammed sketch of the information given in question.

1. Answer: (**Choice d**)

The answer of first question is (Choice d) because we can see that only **D** is the person that got the 5th rank.

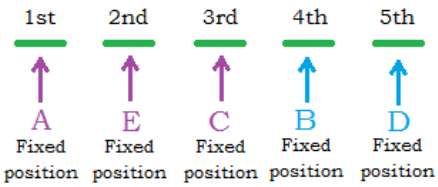
2. Answer (**Choice e**)

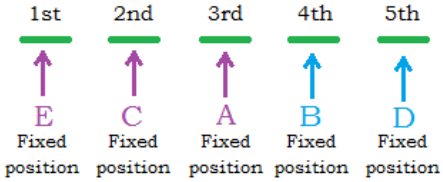
This question makes further restriction to **A**, by stating specific place for **A**. Because the position of **A** becomes on the place that has next adjacent place of **B**, who is at 4th rank, therefore the rank of **A** is 3rd here according to the information of question. So we should change the original diagram according to the information of this question and solve for the first position, as shown below:



3. Answer (**Choice c**)

To answer this type of question, always start from the original drawing and place the persons to the ranks that are fixed. So we should place **B** at 4th and **D** at 5th rank respectively that are fixed. Now as there are 3 persons remaining with three ranks such that **E** & **C** will place together, i.e., **A** can't be placed between **E** and **C**. Therefore, only two arrangements are possible. To solve it we need to suppose (**E**-**C**) as one pair that can't be separated or interchanged (i.e. can't be placed as (**C**-**E**), as **C** will have rank after **E**. These two possible arrangements are shown below:





Except these two arrangements/orders of ranking, any arrangement would be incorrect. So only **choice (c)** cannot be the possible arrangement of ranking from Top to Bottom.

4. Answer (**Choice c**)

Refer to the explanation of Question 3 above. As there are only two possible arrangements of ranking, therefore **choice (c)** would be the right answer.

Basic Verbal Reasoning

Before going ahead, it is extremely important to read the answers of the following frequently asked questions about GAT *Verbal Reasoning* section:

Important Frequently Asked Questions

What is tested in GAT Verbal Reasoning?

This section grades you on your comprehension, vocabulary, analogies and some grammatical knowledge. This section requires practice of very good resource as available in *The Best Book for GAT Preparation – by* ***Earnest Prep***. In this section, your speed of reading and understanding the passage and vocabulary in addition to grammar is tested. Although, vocabulary is tested in three ways: *Synonyms*, *Antonyms* and *Text Completion*. In this book, approx. 500 words are covered that are more than enough. These words are frequently tested in GAT (General).

What's the trick to get 99th percentile rank in GAT Verbal Reasoning Section?

Keep the following important points in mind, this would help you in achieving the target score in this section:

- If you are not good in reading, always make a habit of reading especially newspaper (e.g. DAWN newspaper), and especially Editorial page, which is on the back of the newspaper when you completely open the paper.
- If you want to become expert in verbal section, you should love reading a lot. Try to buy good novels that you can read at night time before sleep. If you make this habit, you will definitely see significant difference. Those who are extremely good in verbal, they have habit of reading novels daily.
- Each verbal question type has specific strategy and concepts, which are discussed in this book. Always keep in mind those strategies while answering the verbal reasoning question.
- If you hate reading, you should start loving it, because without passion of reading, you cannot get 99th percentile in verbal section. And passion of reading will help you to do more and more practice and hence get improve your performance in this section gradually.
- Do not waste your time in learning thousands of vocabulary words, rather simply remember 500 frequently used words for GAT (General) that is part of 20-days study plan in this book. If you follow the 20-days study plan, you can complete these 500 frequently use NTS vocabulary.

Basic Sentence Structure

She*(subject)* goes*(verb)* to school*(object / complement)* in the morning*(Modifier)*.

Subject: The part of sentence, which performs the action (i.e. which do the verb)

Verb: The action which the subject performs. {i.e. goes is an action performed by She*(subject)*}

Complement: The part of sentence to which the action is done, (i.e. to school is a complement)

Modifier: The part of sentence which gives additional information and not necessarily contains a subject, or a verb or both subject and verb. (i.e. in the morning is a *modifying phrase*. We'll discuss modifiers, phrases and clauses later on in advance level preparation plan i.e. Day 4 and 5.)

Sentence

A sentence is a group of words that makes complete sense. In order to make complete sense, the words must include a *subject* and a *verb*. For instance:

Example of short Sentences (containing both ***subject*** and *verb*):

- **He** goes
- **Baby** cries
- **She** walkup
- Bring **a chair**
- Open **the door**
- Have **a look**

Note that the subject may also come after the verb, i.e. the subject not necessarily come at start of the sentence.

Subject

The subject is the sentence which performs the action. It is the person or thing that performs, or is responsible for, the action of the sentence. Often it comes at beginning of the sentence and precedes the verb, but sometimes it comes after the verb.

Every sentence in English must have a subject. Commands will not have a visible subject, however, the subject [you] is understood. Example:

Work quickly! = **You** work quickly!

The subject can be a single noun:
Cats chase mice.
Children like candy.

The subject can also be a noun phrase, which is a group of words ending with a noun. A noun phrase CANNOT begin with a preposition (See more under Prepositions and Prepositional Phrases later in the book):

This blue colored car is in the garage.
That hot red dress looks fabulous.

Verb

A verb normally reveals the action of the sentence. Every sentence must also have a verb in order to make a complete sense, otherwise the sentence cannot be called as complete sentence. The verb can be a single word:

Wasif likes eating cookies.
They play snooker.
The verb can also be a verb phrase. A verb phrase contains one, or more, auxiliary (i.e. helping) verbs and one main verb. The main verb is always preceded by the auxiliary verbs.

Sana has been talking to her new friend.
His mother is visiting his school today.
Bilal has returned from school.
Hamid is playing in a tournament tomorrow.

Compliment (Object)

A complement (object) is usually a noun or a noun phrase, which provides more information about the verb. Often, it follows the verb in a sentence relaying active voice.

A complement (object) answers the question *what*, *whom* or *where*?

Examples of complements

Ahmed threw *the stone* in the flowing river.	(*What* did Ahmed throw?)
The hungry bird ate *a worm*.	(*What* did the bird eat?)
He called *Janice* after the party.	(*Whom* did he call?)
She was chewing *gum* in class.	(*What* was she chewing?)
The ball hit *Mike* during the game last night.	(*Whom* did the ball hit?)
He goes *to school* in the morning.	(*Where* does he go?)

Modifier

A modifier tells the time, place, or manner of action. The modifier usually follows the complement. Not every sentence requires a modifier. Prepositional phrases are commonly used as modifiers (See more under Prepositions and Prepositional Phrases later in the book).

Examples of prepositional phrases

under the house, *after breakfast*, *in the morning*

Adverbs and adverbial phrases are also used as modifiers, or modifiers of time. A modifier of time will usually come last when more than one modifier is used.

Examples of adverbs and adverbial phrases:

yesterday, *quickly*, *last semester*, *overhead*, *quite awful*

A modifier answers the question of *where*, *when* or *how*?

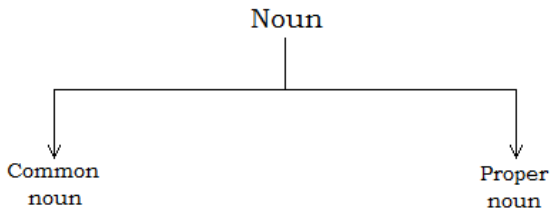
Examples of modifiers

She is earning her degree at Punjab University.	(*Where* is she earning her degree?)
Bilal fell down the stairs	(*Where* did Bilal fall?)
Bilal fell down yesterday.	(*When* did Bilal fall?)
The cheetah was running quite fast.	(*How* was the cheetah running?)
We have an appointment at ten o'clock tomorrow.	(*When* do we have an appointment?)
The soldier fired the gun repeatedly.	(*How* did the soldier fire the gun?)

Parts of Speech

1. Noun*(n)*

It's the name of *person*, *place*, *thing* or *idea*. There are two types of noun as shown below:



Common noun: It's the name of common things: *child*, *president*, *school*, and *season*.

As you see there is no specific one child in the world; in fact, there are many children. Similarly, there are no specific one president, one school and one season in the world; in fact, there are many of these in the world. So, in short, common noun names any specific *group of things* rather than one specific thing.

Proper noun: It's the name of specific people, things or places: *Governor Jinah*, **Formen Christian College**, *ARY News*, *Spring season* and Ahmed etc.

Noun can come anywhere in a sentence. The underlined words below are nouns.

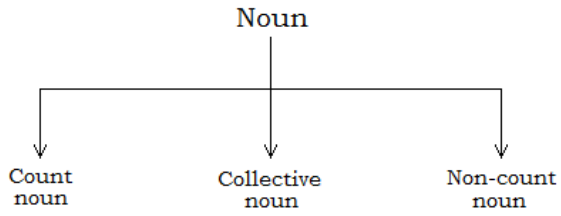
The School-bus arrived.

After getting his awesome test score, Bilal got admitted to six best universities.

A sentence may have unlimited common and proper nouns, as long as the sentence continues to make sense.

Singular noun names one person, place or thing (cat, house), while a plural noun names more than one person, place or thing (cats, houses).

Nouns can further be categorized as **count nouns**, **non-count nouns**, and **collective nouns**, as shown below:



Count noun: it can be counted: *pen*, *blocks*, *ducks*, and *drops of water* (one pen, seven blocks, two thousand ducks, and hundred drops of water).

Non-count noun: It cannot be counted: *flow*, *grass*, *wood*, and *water* (two flow?, three flow…?; two grass?, three grass…?; two wood?, three wood…?; two water?, three water…? All doesn't make sense.)

Notice that drops of water are count noun, while water is non-count noun.

Collective noun: Singular count nouns that identify a group: *panel*, *committee*, *choir*, *faculty*, *team*, *army*, and *jury*.

2. Pronoun*(pr)*

It's a person, place, thing, or idea that replaces a noun.

Pronouns such as *he*, *we* and *them*, are words that are used to replace a noun.

When Ms Laiba told Asim that he could take home their classroom sandwich for summer, he called his mother and told her that she need to pick it up after school.

Antecedent: The noun to which a pronoun refers/replaces is called an antecedent.

Imran called his mother for early breakfast, because he has to go early to school.

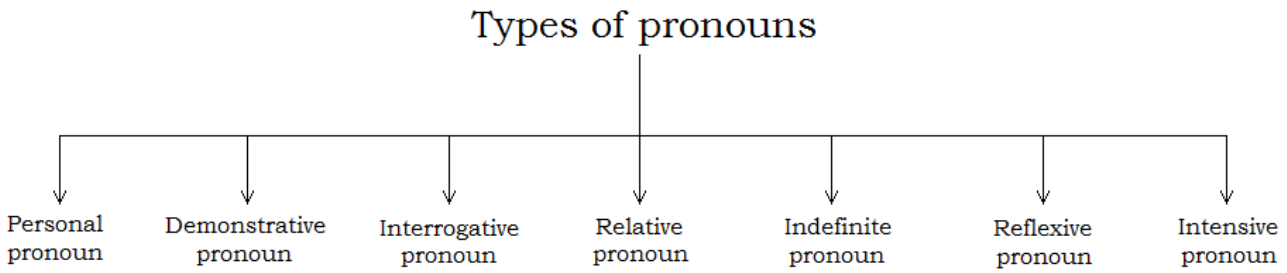
In the sentence above, Imran is antecedent for 'his' and 'he'. In other words, antecedent is a parent word to whom pronoun/pronouns refer. While most pronouns will have an antecedent, beware of the occasional sentence without an antecedent. Take the following sentence for example:

Everyone must take a seat before the match begins.

Everyone does not have an antecedent because it understood that everyone refers to all of the people in the ground-seats at the time the match begins.

Types of pronouns

There are seven different types of pronouns as shown below, and a basic understanding of each is important for succeeding on preparation of Sentence Correction part of this exam.



***a*. Personal Pronouns**

As the name implies, these pronouns get personal; they refer to specific person or thing, and include persons, like I, he, hers, and us.

Although she was best known for her art, Roza also published cook books.

After the kids watched the movie, the baby-sitter served them dinner.

***b*. Demonstrative pronouns**

Demonstrative pronouns demonstrate. They point to nouns that are nearly in time or space. There are four demonstrative pronouns: this, that, these and those.

These shirts should be marked half price.

That cannot happen again.

***c*. Interrogative pronouns**

This type of pronoun interrogates, or asks questions. The four main interrogative pronouns are who, whom, which, and what.

Who took the last slice of pizza?

Which band member is your favorite?

***d*. Relative pronouns**

Relative pronouns relate. They connect a phrase to the antecedent. There are four specific relative pronouns: who, whom, that, and which.

The nurse who gave you the injection has the day off.

Notice that who is also a relative pronoun, but important point is that in relative pronoun, who always come just after the noun to whom it refers.

The only thing that matters is your safety.

You see that pronouns 'who' and 'that' refers to their immediate nouns that came before these pronouns.

***e*. Indefinite pronouns**

These pronouns are not definite; they refer to a person or thing that is identified, but is not specific. There are dozens of indefinite pronouns, and some examples include everybody, few, each, and somebody.

Many of the balloons pepped before they were released.

You can put anything on the pizza you want.

***f*. Reflexive pronouns**

Reflexive pronouns reflect back onto the noun. They are myself, yourself, herself, himself, itself, ourselves, yourselves, and themselves.

The CEO does the hiring himself.

I gave myself a haircut.

***g*. Intensive pronouns**

These pronouns intensify or emphasize the antecedent. They take the exact same form as reflexive pronouns, but they follow the noun more closely.

I myself would prefer to eat in the non-smoking section.

The office manager herself said that we're all getting bonuses.

Several pronoun concepts are tested in sentence correction, including pronoun-antecedent agreement and implied and ambiguous pronouns. These potential errors are covered in detail later on. Your ability to quickly spot a pronoun and its antecedent can save your valuable time.

Remember, you do not have to memorize the names of the seven types of pronouns. You simply must understand that pronouns take many different roles in a sentence.

3. Verb*(vb)*

It's a word showing action or state of being.

Every sentence must contain a verb. The simplest sentence in the English language is only three letters long, containing a pronoun and a verb.

I am

I do

Most sentences are more descriptive, but they all contain at least one verb:

I went to the Joyland Park.

The journey was too long.

Some verbs are made up of more than one word. Helping-verbs*(hv)* such as be, shall, can, must, and would are added to action verbs to help express time and mood. Look at the following sentence:

The student is playing at football ground.

In this sentence, *is* joins *playing* to show that the student is currently at football ground. If the word *was* were substituted for the word *is*, the sentence could have taken on a new meaning because then the student had played at the football ground in the past. Other helping verbs include can, could, may, might, must, need, ought to, shall, should, will, would, and used to. The verb phrase may contain several helping verbs:

In January, Asif will have been working here for four years.

The **helping-verbs***(hv)* in this sentence indicate that Asif began working in past and will continue working into future. Helping verbs are necessary to convey timing.

Linking verbs*(lv)* on other hand, rather than showing action, links a noun or pronoun to additional information about that noun or pronoun:

The smoked herring is*(lv)* delicious.

In this sentence the noun herring, is not performing any action (such as swimming or fleeing). Instead, a linking verb provides information about the herring: it is delicious. Look another:

I am*(lv)* a sales representative for a paper company.

Other linking verbs include sensory verbs (*see*, *hear*, *taste*, *smell*, *feel*) and verbs that reflect a state of being (such as appear, become, prove, remain, seem).

Sara seems*(lv)* happy.

The dirty sock smells*(lv)* repulsive.

Remember that many linking verbs can also be regular verbs which show action:

The boy smells*(vb)* the dirty sock.

In this sentence, the word *smells* is an action verb because it shows what the boy is doing. To test a sensory verb or a state of being verb for its classification as a linking verb or an action verb, substitute the verb to be in the sentence. If the sentence still makes sense, the original verb is a linking verb. If the sentence no longer makes sense, the original verb is an action verb:

The dirty sock smells repulsive.

The dirty sock is repulsive.

Smells = linking verb

This sentence makes sense, so *smells* is functioning as *linking verb* in the original sentence.

The boy smells the dirty sock.

The boy is the dirty sock

Smells = action verb.

The second sentence does not make sense in this example; thus, smells occurs as an action verb in the first sentence.

Verbals: are words that are based on verbs, but function as other parts of speech in sentence. One type of verbal is infinitive, which is root of the verb combined with the word to:

To draw

To eat

To remember

To waste

Infinitives can act as adjectives and adverbs but are most often nouns:

I learned*(vb)* to cook*(n)* when I was in college.

Some students may struggle with this concept, wanting to group to cook with the verb, learned. But replace to cook with a true noun:

I learned*(vb)* biology*(n)* when I was in college.

This should help you clearly see that to cook is a noun which follows the verb.

Another verbal is the *gerund*. Gerunds are often mistaken with verbs because they end in *–ing*, but gerunds function as a noun. Look at how running can be used as an action verb or a gerund:

I was*(hv)* running*(vb)* for my life!

Running*(n)* is*(lv)* my favorite form of exercise.

Again, if you have trouble visualizing running as a noun in the second sentence, replace it with an unquestionable noun:

Running is my favorite form of exercise.

Aerobics is my favorite form of exercise.

Few students will question that aerobics is a noun, and it should help you see that running functions as a noun in the same sentence.

The final verbal is the participle. Participles are verb forms that function as adjectives and most often end in *–ing* (present participles) or *–ed* (past participles). Look at below examples how the word frighten can be used as verb and as verbal adjective:

The dog is*(hv)* frightening*(vb)* the mailman.

The frightening*(adj)* dog lunged at the mailman.

The frightened*(adj)* dog hid from the mailman.

As with the two previous verbals, substitute a true adjective into the sentence in order to confirm the verbal is a participle:

The frightening*(adj)* dog lunged at the mailman.

The scary*(adj)* dog lunged at the mailman.

And,

The frightened*(adj)* dog hid from the mailman.

The timid*(adj)* dog hid form the mailman.

Because every sentence contains a verb, errors with verbs are extremely popular test questions, and we'll discuss verb tense and verb form in more detail later.

Every sentence must contain a verb, so it should be no surprise that verb errors are prevalent on such exams. If you can discern verbs from infinitives, gerunds, and participles, you can quickly catch errors in agreements, tense, and form. Verbs are thoroughly covered later on.

4. Prepositions*(prep)*

Preposition – word used to link a noun or pronoun to other words.

Prepositions describe a relationship or situation between words in the sentence. Try to define one, like *above, around* or *on*. The most common prepositions include:

about, across, after, against, among, around, as, at, before, behind, between, by, during, for, from, in, including, into, like, off, on, over, through, to, towards, under, upon, with, within, and *without*.

Prepositions never come alone; they are always in a prepositional phrase. Prepositional phrases begin with a preposition and end with a noun or pronoun, which is called the object of the preposition. Look at several prepositional phrases with the preposition and its object identified:

to*(prep)* the store*(n)*

from*(prep)* a distant land*(n)*

Prepositions most often describe time (at, by, during), place (above, on, within), or movement (to, towards).

Because many prepositions are only two or three letters long, they are popular errors on such exams. The test makers hope that you will not notice an error in such a small word.

5. Adjectives*(adj)*

Adjective – words which describes or modifies a noun or a pronoun.

Adjectives are called modifiers because they modify a noun or pronoun in a sentence.

They make an apple shiny and read or an orange juicy and sweet.

Adjectives make our language more colorful and descriptive, and most authors are armed with an arsenal of adjectives. Take this passage from a famous novel "The Great Gatsby", by F. Scott Fitzgerald:

'A stout, middle-aged man, with enormous owl-eyed spectacles, was sitting somewhat drunk on the edge of a great table, starting with unsteady concentration at the shelves of books.'

Remove the adjectives and adjective phrases and the sentence loses its brilliance:

'A man was sitting somewhat drunk on the edge of a table, staring with concentration at the shelves.'

We no longer know the man's appearance, his age, or the degree of his concentration. Plus, we have lost details about the table and the shelves. Adjectives help make the literary world more vivid and interesting.

Adjectives most often come before the noun or pronoun they are modifying:

The choppy*(adj)* water*(n)* caused the small*(adj)* boat*(n)* to roll.
I bought an inexpensive*(adj)* purse*(n)* in a charming*(adj)* French*(adj)* village*(n)*.

Adjective can also come after a linking verb to modify the noun or pronoun before the linking verb:

The water*(n)* is*(lv)* choppy*(adj)*.
They*(pro)* are*(lv)* inexpensive*(adj)*.

Errors with adjectives will be discussed later, but it is important to know that adjectives are often confused with the next part of speech, adverbs.

The determiners 'a', 'an' and 'the' are a special group of adjectives called *articles*, we'll discuss these as well later.

6. Adverbs*(adv)*

Adverbs – words which describes or modifies a verb, and adjective, or another adverb.

Adverbs are also modifiers. However, unlike an adjective which modifies a noun or pronoun, adverbs modify a verb, an adjective, or another adverb. Three examples follow.

Adverb modifying a verb:
Maria quickly*(adv)* ran*(vb)* down the field.

Adverb modifying an adjective:
Maria ran down the very*(adv)* long*(adj)* field*(n)*.

Adverb modifying another adverb:
Maria ran*(vb)* quite*(adv)* slowly*(adv)* up the field.

It is true that most words that end in *–ly* are adverbs: *quickly*, *sadly*, *loudly*, and *carefully*. But adverbs do not have to end in *–ly*, such as *quite* and *very*. Also, not all words that end in *–ly* are adverbs. Words such as friendly, lonely, and sparkly are adjectives.

Exercise – Using Adjectives and Adverbs

Underline the correct adjective or adverb in parentheses. Then write AJ for adjective, or AV for adverb, in the blank at the end of the sentence to determine in what capacity the chosen word is used.

Example: He likes (sad, sadly) movies. __AJ__

1. They sing (good, well). _____

2. Ellen's chocolate cake is (delicious, deliciously). _____
3. The students speak (fluent, fluently) English. _____
4. The students speak English (fluent, fluently). _____
5. This is an (awesome, awesomely) painting. _____
6. The lady at the opera sang (beautiful, beautifully). _____
7. (Incredible, Incredibly), the baby survived the plane crash. _____
8. That is a (considerable, considerably) fee to enter the game. _____
9. The fee is (considerable, considerably) more than I expected. _____
10. He needs to swim (fast, fastly) in order to beat the champion. _____

Adjectives and Adverb Phrases

One more final note about adjectives and adverbs before their specific errors are discussed later: phrases—especially prepositional phrases—can also take on the modifying role of an adjective or an adverb:

Maria runs*(vb)* like the wind*(adj)*.

'Like the wind', typically a prepositional phrase, takes the role of an adverb. It tells the reader how Maria runs, thus modifying a verb. 'Like the wind' is an adverb phrase. Look at another:

Shumaila, the star athlete at my high school, runs every day.

The noun phrase, *the star athlete at my high school*, has become an adjective. It modifies Shumaila, the main noun, making it an adjective phrase.

Read again the sentence from famous novel *The Great Gatsby*:

'A stout, middle-aged man, with enormous owl-eyed spectacles, was sitting somewhat drunk on the edge of a great table, starting with unsteady concentration at the shelves of books.'

Now, study it with the adjectives and adverbs underlined:

A*(adj)* stout*(adj)*, middle-aged*(adj)* man, with enormous owl-eyed spectacles*(adj phrase)*, was sitting somewhat*(adv)* drunk*(adv)* on the edge of a great table*(adv phrase)*, staring with unsteady concentration*(adv phrase)* at the shelves of books*(adv phrase)*.

Now, look at the sentence with all of the adjectives and adverbs removed:
Man*(n)* was*(hv)* sitting*(vb)*, staring*(vb)*.

This exercise makes it easy to see why adjectives and adverbs are so important to English language.

7. Conjunctions *(conj)*

Conjunctions – word which links words or phrases.

There are three types of confections: coordinating conjunctions, subordinating conjunctions, and correlative conjunctions.

Coordinating conditions: These are the most common, of which there are seven:
and but or yet for nor so

Coordinating conjunctions are those connecting words used to join nouns, pronouns, verbs, prepositional phrases, adjectives, and even adverbs:

Nouns: Pakistan or Bilal
Pronouns: he or she
Verbs: going or play
Prepositions: of the people, for the people, and by the people
Adjectives: red, white, and blue
Adverbs: quickly but quietly

Coordinating conjunctions are also used to join two complete sentences:

Toni wrecked the car. She was not injured.

Toni wrecked the car, but she was not injured.

Such type of sentence completion usually come in GAT (General) exam, where you need to select best conjunction rather than a vocabulary word for the blank. As in above example, you must select conjunction *'but'*.

Similarly, see another example:
You may choose to be quiet. You may choose to leave.
You may choose to be quiet, *or* you may choose to leave.

Taking two complete sentences and joining them with a coordinating conjunction is appropriately called coordination. **It takes two equally important sentences and fuses them together with a comma and a conjunction**.

Subordinating conjunctions include words like although, once, rather than, and until. They are also used to join two sentences, but one of the sentences is rearranged to become a phrase:

The car was low on gas. Sana turned off the air conditioner.
Because the car was low on gas, Sana turned off the air conditioner.
I decided not to invest in the internet. I put my savings into a restaurant.
Rather than investing in the internet, I put my savings into a restaurant.

Correlative conjunctions These are a type of coordinating conjunction, but they are like twins. Correlative conjunctions include:
either ... or *neither ... nor* *both ... and ...* *not only ... but also* not ... but as ... as

Look at few examples:

I can *either* take the bus *or* participate in a carpool.
The amazing piano player is *both* blind *and* deaf.
Swimming is *not only* great exercise *but also* an enjoyable pastime.

Conjunctions are common parts of speech, and therefore they are common errors on such exams.

8. Interjections*(int)*
Interjection – word used to convey emotion

Finally, Interjections are added to a sentence to show emotions, so they do not affect any other part of the sentence. Words like Wow, Oh, and Eh? are interjections. Because they are not common in formal writing, writing, interjections are not tested in GAT. Hurray!

This is the perfect time to study NTS vocabulary (Frequently used wordlist). So, let's learn 25 words for the first day and learn its usage in sentence. Later days include 33 words daily.

NTS Vocabulary (650 GAT Frequently Used Words)

Sr#	Word	Meaning	Synonyms	Antonyms
001.	concise	brief and to the point	succinct; terse; brief; short; lessen; abridge	prolix; discursive; protracted; circumlocutory; verbose
002.	laconic	using few words	taciturn; reticent; terse; brusque; brief	garrulous; loquacious
003.	succinct	spoken or written in a clear and precise manner	terse; concise; curt; pithy; compact; condensed	prolix; discursive; protracted; circumlocutory; verbose; wordy
004.	brusque	rudely abrupt or harshly brief	curt; abrupt; petulant; brief	polite; courteous; kind
005.	abridge	shorten a written text	abbreviate; concise; shorten	augment; amplify; protract
006.	brevity	quality of succinct expression (derived from the word brief)	conciseness; pithiness; succinctness; laconism; economy	longevity; permanence
007.	conspire	plan together secretly to commit an unethical or illegal act	collude; devise; collaborate; contrive	leave; neglect; disagree
008.	concur	agree	accord; harmonize; cohere; consent	clash; disagree; deny; dissent
009.	concord	a state of harmony; mutual agreement	unanimity; consensus; harmonize	discord; agitate; disunity; disturb; hostility
010.	congenital	existing at birth	innate; inherited; inborn; indigenous	non-native; unconstitutional
011.	schism	a division into political or religious faction (i.e. groups)	alienation; faction; rift; divergent; division; discord; fissure; dissension	agreement; harmony; peace; accord; unity; conformity
012.	incisive	intelligent; keen; insightful	acute; keen; astute; canny; perspicacious; judicious; shrewd	weak; stupid; incompetent; innocent; vacuous; vapid; obtuse
013.	judicious	reasonable; sensible; showing sound judgement; careful	prudent; astute; cautious; circumspect; sagacious; shrewd; sober; rational	rash; improvident; careless; irrational; imprudent; ignorant; inattentive; unsound; unrealistic; unwise
014.	astute	keen; intelligent; crafty	sagacious; shrewd; incisive; canny; perspicacious; adroit; insightful; discerning	vacuous; vapid; obtuse; foolish; stupid; inept; idiotic; naïve; imbecile; asinine
015.	scrutinize	to examine carefully	analyze; peruse; scan; watch; check; investigate; study	forget; ignore; neglect; misunderstand
016.	pragmatic	concerning to practical outcomes; down-to-earth	efficient; logical; practical; realistic; sober	idealistic; imaginative; irrational; excited; impractical; unreasonable
017.	perjure	to lie under oath; bear false witness	prevaricate; deceive; delude; equivocate; falsify; forswear;	honest; sincere; attest; certify; prove

			mislead; trick; lie	
018.	prudent	wise; intelligent; careful	judicious; sensible; cautious; reasonable; shrewd; frugal; economical; circumspect	improvident; rash; careless; expensive; foolish; hasty; reckless; stupid; wasteful; unreasonable; thoughtless
019.	jurisdiction	area of authority; scope; zone; limits; range	domain; authority; control; command; power; territory; supervision; district	incapacity; submission; surrender; weakness
020.	adjure	order; to command solemnly as under oath	beseech; command; charge; entreat; implore; obligate	answer
021.	adjudge	determine based on law	adjudicate; arbitrate; award; decide; decree; determine	defer; hesitate; ignore; leave
022.	acumen	keenness of judgement; ability to understand and reason	shrewdness; perspicacity; discernment; awareness; intellect; intelligence; judgement; vision; wisdom; acuteness; cunning; smart; perception; sharpness	ignorance; insensitivity; stupidity; mistake; ineptness; obtuseness; foolishness
023.	inscrutable	beyond comprehension or imagination; difficult	abstruse; enigmatic; recondite; impenetrable; ambiguous; arcane	clear; comprehensible; intelligible; fathomable; obvious; plain
024.	allegation	blame; charge	charge; contention; accusation; assertion	exculpation; denial
025.	affirmation	declaration of the truth of something	confirmation; assertion; certification; ratification; testimonial	negation; denial; veto; nullify

Practice Exercise

1. Hamza is amazingly _____ at such a young age of 5 years: He adeptly persuaded his reluctant parents to let him stay up to watch another hour for cartoon series on television.

A) concise
B) astute
C) verbose
D) adjure
E) capricious

2. Because we are short on time, _____ appreciated; we need to leave in five minutes to catch the bus.

A) circumlocution
B) allegation
C) pontification
D) brevity
E) affirmation

3. Those not used to Imran's _____ speaking style found him to be _____ and did not like him at first.

A) affirmative … incisive
B) surly … congenial
C) laconic … brusque
D) circumlocutory … direct
E) garrulous … phlegmatic

From the given words inside bracket, write the word whose meaning is given:

(*brusque, succinct, astute, prudent, perjure, garrulous, judicious*)

From the above words, write the word whose meaning is given below:

4. keenness of judgement: _____
5. talkative: _____
6. rudely abrupt: _____
7. intelligent: _____
8. false witness: _____
9. reasonable: _____
10. speak precisely and clearly: _____

Answers & Explanation

1. **B**: The colon (:) introduces an explanation. Adeptly means with great skill. A young age of 5 years would have to be pretty *sharp* or *smart* enough to persuade reluctant parents.

concise: brief and to the point
astute: shrewd; smart; sharp
verbose: wordy
adjure: order; command
capricious: changeable; unpredictable

2. **D**: A person short on time would likely appreciate something that is quick, which makes quickness a good choice.

circumlocution: speaking irrelevant or not speaking to the point
allegation: charge; accusation
pontification: speaking in a pompous manner
brevity: briefness; short and quick
affirmation: positive assertion; declaring truth

3. **C**: They didn't like him at first, so the second blank is a negative word. The first blank should describe a speaking style that would cause some-one to think that he is described by the second word.

affirmative: declaring truth
surly: irritable; ugly; rude
laconic: short; lacking words; brief
circumlocutory: using too many words
garrulous: very talkative
incisive: keen; insightful; intelligent
congenial: friendly; favorable
brusque: rudely abrupt in speech
direct: to the point
phlegmatic: lacking energy; calm; emotionless

4. astute
5. garrulous
6. brusque
7. prudent
8. perjure
9. judicious
10. succinct

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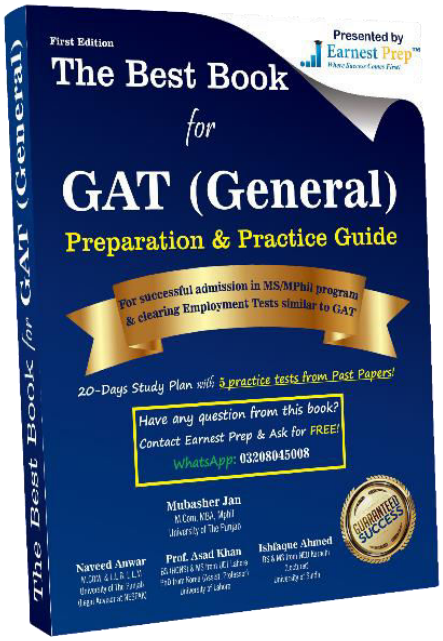

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