

GENERAL APTITUDE

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What is **Aptitude?**

It is your natural ability to learn or excel in a certain area.

For example, you could have an aptitude for math and logic.

Key to success

- 1. Problem Recognition
- 2. Speed
- 3. Practice



Link for **English Basics**

- https://www.myenglishpages.com/english/exercises.php
- https://www.grammarbank.com/
- https://www.really-learn-english.com/english-grammar-exercises.html
- https://www.really-learn-english.com/english-reading-comprehension-text-and-exercises.html
- Practice Synonyms and Antonyms regularly.
- Read Idioms and Phrases.
- Book Word Power Made Easy by Norman Lewis
- Book English Grammar by Wren and Martin



Basic MATHS

- Tables at least from 1-25
- Squares from 1-25
- Prime numbers from 1-100
- Divisibility rules for 1-20

- Methods for typical multiplications & divisions
- Methods for finding HCF & LCM
- Methods for finding squares & square roots

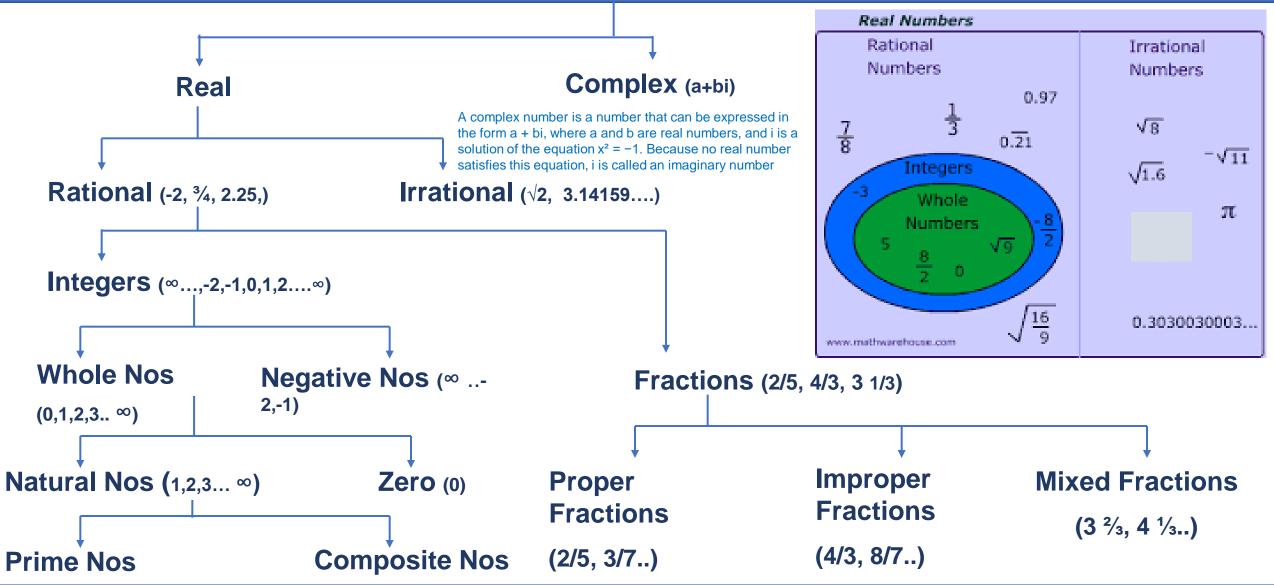


Topic Wise Test Plan

TEST NAME	TOPICS
APTI 1	Numbers + LCM + HCF + Ages + Averages
APTI 2	Percentages + Alligations & Mixtures + Profit & Loss
APTI 3	Time & Work + Pipes & Cisterns + Chain Rule
APTI 4	Time & Distance + Trains + Boats + Interest
APTI 5	Clock + Calendar + Probability + Permutation Combination



Numbers





What is the Difference Between Rational Numbers and Irrational Numbers?

Rational Numbers	Irrational Numbers
Numbers that can be expressed as a ratio of two numbers (p/q form) are termed as a rational number.	Numbers that cannot be expressed as a ratio of two numbers are termed as an irrational number.
Rational Number includes numbers, which are finite or are recurring in nature.	These consist of numbers, which are non-terminating and non-repeating in nature.
If a number is terminating number or repeating decimal, then it is rational. e.g: $1/2 = 0.5$	If a number is non-terminating and non-repeating decimal, then it is irrational. e.g: 0.31545673
Example: - 1/2, 3/4, 11/2, 0.45, 10, etc.	example:-Pi (π) = 3.14159, Euler's Number (e) = (2.71828), and $\sqrt{3}$, $\sqrt{2}$.



Basic MATHEMATICAL operations

- BODMAS
- B Bracket (), {}, []
- O Order
- D Division
- M Multiplication
- A AdditionS Subtraction.



BASIC FORMULAE

- 1. $(a + b)^2 = a^2 + b^2 + 2ab$
- 2. $(a b)^2 = a^2 + b^2 2ab$
- 3. $(a + b)^2 (a b)^2 = 4ab$
- 4. . $(a + b)^2 + (a b)^2 = 2 (a^2 + b^2)$
- 5. $(a^2 b^2) = (a + b) (a b)$
- 6. $(a + b + c)^2 = a^2 + b^2 + c^2 + 2$ (ab + bc + ca)
- 7. $(a^3 + b^3) = (a + b) (a^2 ab + b^2)$
- 8. $(a^3 b^3) = (a b) (a^2 + ab + b^2)$
- 9. $(a^3 + b^3 + c^3 3abc) = (a + b + c) (a^2 + b^2 + c^2 ab bc ca)$
- 10. If a + b + c = 0, then $a^3 + b^3 + c^3 = 3abc$



Basic NUMBER Representation

- Place Value: Units, Tens, Hundreds,
- Value of a 2 digit no. 'ab' where both a & b are natural numbers = 10(a) + b
- The number with reversed digits will be 'ba' & the value of the number will be = 10(b) + a



Numbers

Q. A number consists of two digits.

Sum of the digits is 9. If 63 is subtracted from the number its digits are interchanged. Find the number.

A. 72

B. 90

C. 63

D. 81

Solution:

Let the tens digit be a & units digit be b a + b = 9(1) 10a + b - 63 = 10b + a9a - 9b = 63(2) (1)x99a + 9b = 81(3) (2) + (3) $18a = 144 \rightarrow a = 8$, b= 1 Number = 81

Ans: D



Sum of Natural Numbers

- Rule 1 : Sum of first n natural numbers = $\frac{n(n+1)}{2}$ e.g. sum of 1 to 74 = 74 x (74+1)/2 = 2775.
- Rule 2 : Sum of first n odd numbers = n²
- e.g. sum of first seven odd numbers
- $=(1+3+5+7+9+11+13)=49=7^{2}$.
- Rule 3 : Sum of first n even numbers = n (n+1)
- e.g. sum of first 9 even numbers
 - = (2+4+6+8+10+12+14+16+18) = 90
 - $= 9 (9+1) = 9 \times 10 = 90$



Sum of Natural Numbers

• Rule 4 : Sum of squares of first n natural numbers = $\frac{n(n+1)(2n+1)}{6}$

e.g. sum of squares of first 8 natural numbers

$$= (1 + 4 + 9 + 16 + 25 + 36 + 49 + 64) = 204$$

$$= 8 (8+1)(16+1)/6 = 8 \times 9 \times 17/6 = 204$$

• Rule 5 : Sum of cubes of first n natural numbers = [n(n+1)/2]2

e.g. sum of cubes of first 4 natural numbers

$$=(1+8+27+64)=100$$

$$= [4 (4+1)/2]^2 = 100$$



MULTIPLICATION

1. To multiply by 9, 99, 999....

Place as many zeroes to the right of multiplicand as there are 9s and subtract the multiplicand itself.

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e.g. 26234 x 999 = ?

26234000

- 26234

26207766
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Multiples

 Multiples of number are obtained by multiplying that number by natural numbers.

e.g. Multiples of 3 are 3, 6, 9, 12,

If we want to find no of multiples of 6 less than 255 255 / 6 = 42 (remainder 3) So there are 42 such multiples.



DIVISION

- DIVISION by ZERO is NOT POSSIBLE
- If two numbers are divisible by a number then their sum & difference is also divisible by the number.
- E.g. For 63 is divisible by 9. 27 is also divisible by 9.
- So 63 + 27 = 90 is also divisible by 9
- And 63 27 = 36 is also divisible by 9



- 2: Unit place is even or zero(last digit should be divisible by 2)
- 3: Sum of the digits is divisible by 3. e.g: 324
- 4: Last 2 digits are divisible by 4 or last 2 digits are 0. e.g: 324
- 5: Unit digit is 5 or 0
- **6**: Divisible by co primes **2** & **3**. e.g : 324
- 8: Number formed by last 3 digits is divisible by 8 or last 3 digits are 0.
 - e.g: 1088
- 9: Sum of all digits is divisible by 9. e.g: 324
- 10: Units digit is 0.



• 11: Difference between sum of digits in odd & even places should either be zero or divisible by 11

e.g: 8283

e.g: 918071

- 12 : Divisible by co primes 3 & 4 e.g : 324
- 14: Divisible by co primes 2 & 7
- 15 : Divisible by co primes 3 & 5
- 16: No formed by last 4 digits divisible by 16/ last 4 digits 0.
- 18: Divisible by co primes 2 & 9
- 20 : Units digit 0 & tens digit is even.



• 7: The difference between the two alternate groups taking 3 digits at a time should either be zero or multiple of 7.

eg-550500006

eg-7370356

• 13: The difference between the two alternate groups taking 3 digits at a time should either be zero or multiple of 13.

eg-200174



- 17: A number is divisible by 17 if you multiply the last digit by 5 and subtract that from the rest. If that result is divisible by 17, then your number is divisible by 17.
- For example, for 986, then: 98 (6 x 5) = 68.
- Since, 68 is divisible by 17, then 986 is also divisible by 17.
- Also, 876 is not divisible by 17 because $87 (6 \times 5) = 57$ and 57 is not divisible by 17.

- 19: To determine if a number is divisible by 19, take the last digit and multiply it by 2. Then add that to the rest of the number. If the result is divisible by 19, then the number is divisible by 19.
- For example, 475 is divisible by 19 because $47 + (5 \times 2) = 57$, and 57 is divisible by 19.
- But , 575 is not divisible by 19 because $57 + (5 \times 2) = 67$, and 67 is not divisible by 19.





