

Q Aptitude + Logical Reasoning

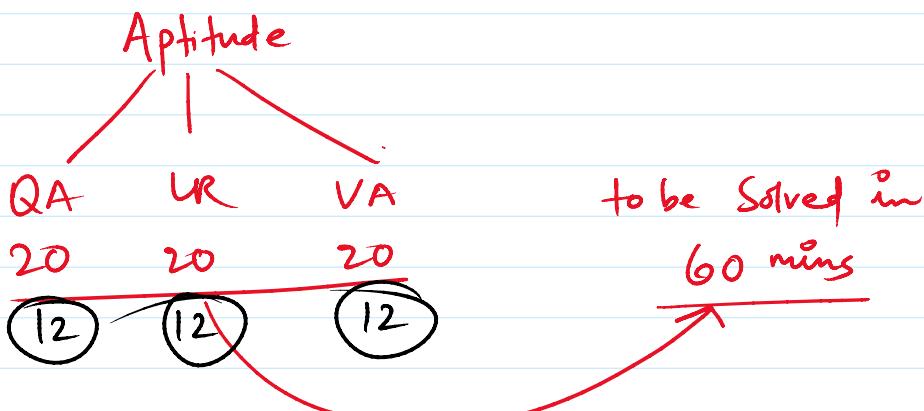
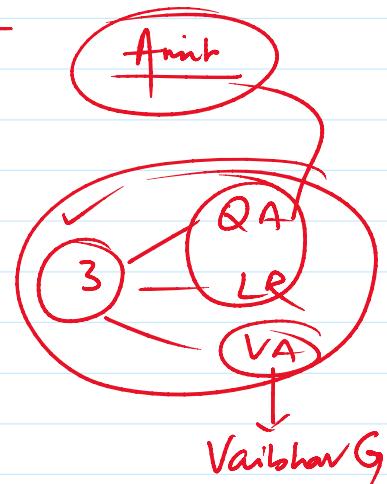
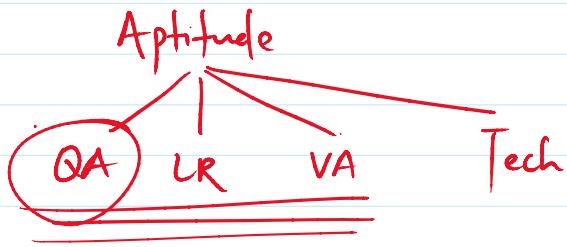
QA / Maths

Xth & below

LR

Olympiad

Final



36 — 3600 Secs

1 Q — 100 Secs

20 Questions

Aptitude :

1. Accuracy

2. Time Management

3. Marking

Easy → 40 Secs

Moderate → 60 Secs - 70 Secs

Difficult →

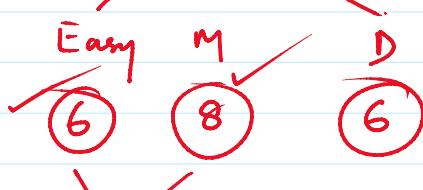
150 Secs - 600 Secs
900 Secs

100% — 36 Questions

80% — 45 Questions

60% — 60 Questions

20 Questions (QA/LR/VA)



$$\begin{matrix} 7 & 7 \\ 8 & 6 \end{matrix}$$

$$\begin{matrix} 1. & \times \\ 2. & \times \\ 3. & \times \end{matrix}$$

Mixed.

12 Questions

Questions — Tricks.

12 | 12 | 12

Easy → ✓ 1. — VA / LR / QA.

START.

Topic

Quicker Calculation.

Add Subtract Multiply Divide.

Fraction
Integer $\frac{P}{Q}$

$$4 \frac{3}{5} + 7 \frac{2}{5} + 8 \frac{4}{5} = ?$$

$$\frac{P}{Q} \quad P < Q$$

$$4 + 7 + 8 = 19$$

$$\begin{array}{r} + \\ \hline 1 \frac{4}{5} \end{array}$$

$$\left[\frac{A}{B} + \frac{C}{D} \right]$$

$$\frac{3}{5} + \frac{2}{5} + \frac{4}{5} = \frac{9}{5}$$

$$5) \frac{9}{5} (1$$

$$\frac{AD+BC}{BD}$$

$$\frac{77}{9}$$

$$20 \frac{4}{5}$$

$$\cdot 9) \frac{77}{72} (8$$

$$8 \frac{5}{9}$$

8 Integer

$$\frac{5}{9} = \text{Fraction}$$

$$\begin{array}{c}
 \text{Diagram showing the decomposition of mixed numbers:} \\
 +4 + \frac{3}{5} \quad +7 \frac{2}{5} \quad -8 \frac{4}{5} \\
 \text{and} \\
 3 \frac{1}{5} \quad -8 \quad -\frac{4}{5}
 \end{array}$$

$$4 + 7 - 8 = 3$$

$$\begin{array}{r}
 \frac{3+2-4}{5} \\
 \hline
 3 \frac{1}{5}
 \end{array}$$

$$4 \frac{7}{8} + 5 \frac{5}{8} - 9 \frac{3}{8} =$$

$$\cancel{4+5-9} = 0$$

$$\begin{array}{r}
 \frac{7+5-3}{8} = \frac{9}{8} = 1 \frac{1}{8} \\
 8) \overbrace{\frac{9}{8}}^1 \quad \leftarrow
 \end{array}$$

$$8 \frac{5}{8}$$

$$-4 \frac{7}{8} + 5 \frac{5}{8} + 9 \frac{3}{8}$$

$$\frac{15}{8} = 1 \frac{7}{8}$$

$$10 \frac{1}{8}$$

$$-4 \frac{7}{8} - 5 \frac{5}{8} + 9 \frac{3}{8} = -4 \frac{7}{8} - 5 \frac{5}{8} - 9 \frac{3}{8}$$

$$-9 \frac{12}{8} + 9 \frac{3}{8}$$

$$-19 \frac{7}{8}$$

$$-9 + 9 \quad -\frac{9}{8} \quad -1 \frac{1}{8}$$

$$4 \frac{7}{8} - 5 \frac{3}{5} + 4 \frac{6}{7}$$

$$\frac{49+48}{56}$$

$$7 \frac{1}{8} - 5 \frac{1}{5} + 4 \frac{1}{7}$$

$$\begin{array}{r} \underline{17+78} \\ 56 \end{array}$$

$$\boxed{4 - 5 + 4} + \frac{7}{8} - \frac{3}{5} + \frac{6}{7}$$

$$\frac{97}{56} - \frac{3}{5}$$

$$\begin{pmatrix} 100 & -3 \end{pmatrix} 5 \\ 500 - 15 = \underline{\underline{485}}$$

$$\begin{array}{r} 485 - 168 \\ \hline 320 \end{array}$$

$$\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$$

$$\begin{array}{r} \underline{317} \\ \underline{-280} \end{array} \quad | \quad \begin{array}{r} \underline{37} \\ \underline{-280} \end{array}$$

$$9 \frac{3}{8} + 7 \frac{3}{11} + 4 \frac{2}{5}$$

$$9 + 7 + 4 = 20$$

$$\frac{3}{8} + \frac{3}{11} + \frac{2}{5}$$

$$\frac{33+24}{88} + \frac{2}{5}$$

$$\frac{57}{88} + \frac{2}{5} = \frac{285 + 176}{440}$$

$$\frac{461}{440}$$

$$\begin{array}{r} 21 \\ \underline{\quad} \\ 440 \end{array}$$

$$2 \frac{3}{5} + 3 \frac{4}{6} + 7 \frac{2}{3} - 8 \frac{4}{6}$$

$$\underline{2+3+7-8 = 4.}$$

$$\frac{5}{15}$$

$$\frac{3}{5} + \frac{4}{6} + \frac{2}{3} - \frac{4}{5}$$

$$\frac{9+10}{15} = \frac{19}{15} \quad 15) \underline{\underline{19}}(1$$

$$6\frac{4}{15}$$

26 | 09 | 26

$$\frac{A}{B} + \frac{C}{B} = \frac{A+C}{B}$$

$$\int \frac{4}{\pi} + \frac{2}{\pi} = \frac{4+2}{\pi} = \frac{6}{\pi} = \boxed{1}$$

$$\frac{A}{B} + \frac{C}{B} = \frac{A+C}{B}$$

$$\frac{A}{B} + \frac{C}{D} = \frac{AXD + BXC}{B \times D}$$

$$\left[\frac{2}{5} + \frac{3}{4} = \frac{8+15}{20} = \frac{23}{20} \right]$$

$$\begin{array}{r} 20 \\ \times 23 \\ \hline 20 \end{array}$$

$$= \frac{1}{20}$$

$$\frac{A}{B} - \frac{C}{B} = \frac{A-C}{B}$$

$$\frac{4}{7} - \frac{2}{8} = \frac{32 - 14}{56} = \frac{18}{56}$$

$$\frac{A}{B} - \frac{C}{D} = \frac{AD - BC}{BD}$$

$$\frac{9}{28} \checkmark$$

$$A \frac{P}{Q} + B \frac{R}{S}$$

$$3\frac{2}{3} + 4\frac{3}{4}$$

A + B

$$\frac{P}{Q} + \frac{R}{S}$$

$$3+4=7$$

$$\frac{2}{3} + \frac{3}{4} = \frac{8+9}{12}$$

$$\frac{11}{3} + \frac{19}{4}$$

$$7+1 = \frac{5}{12}$$

$$44 + 57 = \underline{101}$$

$$\frac{17}{12} = \underline{\textcircled{1}} \frac{5}{12}$$

$$\frac{44+57}{12} = \frac{101}{12}$$

12) 101 (8

$8\frac{5}{12}$

$$7\frac{3}{4} - 5\frac{2}{3}$$

$$7 - 5 = 2$$

$$\frac{3}{4} - \frac{2}{3} = \frac{9-8}{12} = \frac{1}{12}$$

$2\frac{1}{12}$

$$4\frac{3}{4} + 11\frac{7}{8} - 9\frac{5}{6}$$

$$\left(\frac{3}{4} + \frac{7}{8}\right) - \frac{5}{6}$$

$$4 + 11 - 9 = 6$$

$6\frac{19}{24}$

$$\frac{6+7}{8} \quad \frac{\frac{13}{8} - \frac{5}{6}}{48}$$

$\frac{38}{48} \quad \frac{19}{24}$

$$7\frac{3}{5} + 9\frac{4}{8} - 5\frac{1}{2}$$

$$7 + 9 - 5 = 11$$

$$\frac{3}{5} + \frac{4}{8}$$

$11\frac{3}{5}$

$$\frac{44}{40} \quad \frac{11}{10} - \frac{1}{2}$$

$$\frac{22-10}{20} = \frac{12}{20} \quad \frac{4}{10} \quad \frac{3}{5}$$

$$17\frac{7}{8} - 19\frac{5}{9} + 13\frac{3}{8}$$

$$17 + 13 - 19 = 11$$

$$\frac{7}{8} + \frac{3}{8} = \frac{10}{8} - \frac{5}{9}$$

$\frac{90-40}{72} = \frac{50}{72}$

$$\frac{11}{72} = \frac{25}{36}$$

Multiply

$$\begin{array}{r} 21 \\ \times 12 \\ \hline 252 \end{array}$$

$$\begin{array}{r} 1 - 9 \\ \hline 21 \\ 12 \\ \hline 252 \end{array}$$

$$\begin{array}{r} 98 \\ 76 \\ \hline 7448 \end{array}$$

Vedic Mathematics

$$\begin{array}{r} 21 \\ 12 \\ \hline 252 \end{array}$$

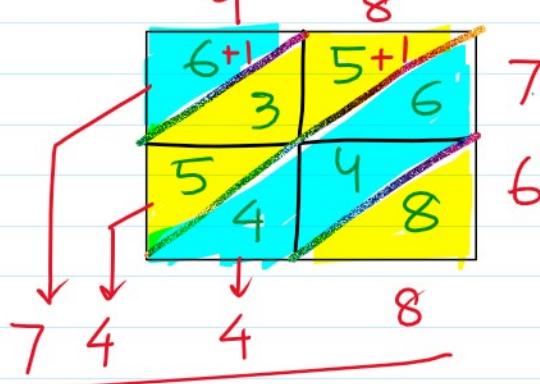
~~11~~

$$\begin{array}{r} 50+8 \\ 50+6 \end{array}$$

$$\begin{array}{r} 98 \\ 76 \end{array}$$

$$63 \quad | \quad 54 \quad | \quad 48$$

$$+ \quad 56 \quad + \quad 48$$



$$\begin{array}{r} A \\ \times \\ C \end{array} \quad \begin{array}{r} B \\ \times \\ D \end{array}$$

$$\begin{array}{r} 7 \\ 6 \end{array}$$

- 1) $48 \times 34 = 1632$
- 2) $72 \times 27 = 1944$
- 3) $49 \times 17 = 833$
- 4) $53 \times 24 = 1272$

$$\begin{array}{r} 48 \\ 34 \\ \hline 1632 \end{array}$$

$$\begin{array}{r} 72 \\ 27 \\ \hline 1944 \end{array}$$

$$\begin{array}{r} 49 \\ 17 \\ \hline 833 \end{array}$$

$$\begin{array}{r} 53 \\ 24 \\ \hline 1272 \end{array}$$

$$\begin{array}{r} 48 \\ 16 \end{array}$$

$$\begin{array}{r} \text{4) } \\ \text{5) } \\ \text{6) } \\ \text{7) } \\ \text{8) } \\ \text{9) } \\ \text{10) } \end{array} \dots \dots \dots$$

$$53 \times 24 = 1272$$

$$16 \times 48 = 768$$

$$\frac{17}{833}$$

$$\frac{18}{16}$$

$$\frac{768}{768}$$

$$\begin{array}{r} \\ \text{7) } \\ \text{8) } \\ \text{9) } \\ \text{10) } \end{array} 49 \times 49 = 2401$$

$$53 \times 53 = 2809$$

$$46 \times 46 = 2116$$

$$97 \times 97 = 9409$$

$$98 \times 98 = 9604$$

$$\begin{array}{r} 4 \uparrow 9 \\ \downarrow \quad \downarrow \\ 1681 \\ \underline{-} \quad 72 \\ 2401 \end{array}$$

$$\begin{array}{r} 5 \uparrow 3 \\ \downarrow \quad \downarrow \\ 2509 \\ \underline{-} \quad 30 \\ 2809 \end{array}$$

$$\begin{array}{r} 12 \uparrow 9 \\ \downarrow \quad \downarrow \\ 144 \quad 16 \\ 96 \\ \hline 15376 \\ \qquad \qquad \qquad 98 \\ 8164 \\ 144 \\ \hline 9609 \end{array}$$

$$\begin{array}{r} 25 \uparrow 7 \\ \downarrow \\ 62549 \\ 350 \\ \hline 66049 \end{array}$$

$$\begin{array}{r} 46 \\ \downarrow \\ 175 \\ 1636 \\ 48 \\ \hline 2116 \end{array}$$

$$\begin{array}{r} 97 \\ | \\ 8149 \\ 126 \\ \hline 9409 \end{array}$$

$$\begin{array}{r} 97^2 \\ (90+7)^2 \\ 8100 + 49 \\ 8149 \\ 1260 \\ \hline 9409 \end{array}$$

$$\begin{array}{r} A \mid B \\ \downarrow \\ A^2 \quad B^2 \\ \hline 2AB \end{array}$$

$$(A+B)^2 = \underline{A^2 + B^2 + 2AB}$$

$$90 \times 7 \times 2 = 1260$$

$$\underline{\underline{3 \times 3}} / \underline{\underline{3 \times 2}}$$

$$\begin{array}{r} 123 \\ 456 \end{array}$$

$$\frac{3 \times 3}{\underline{\underline{}} \quad | \quad \underline{\underline{3 \times 2}}}$$

123
456

A B C
P Q R

AP	AQ	AR	BR	CR
$\begin{matrix} + \\ BP \end{matrix}$	$\begin{matrix} + \\ CP \end{matrix}$	$\begin{matrix} + \\ CQ \end{matrix}$	$\begin{matrix} + \\ QC \end{matrix}$	
				17

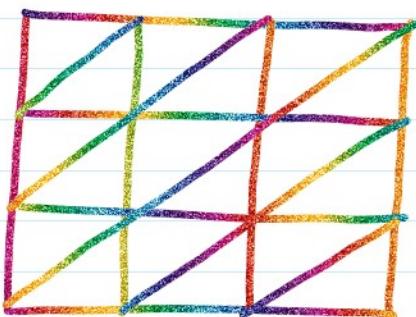
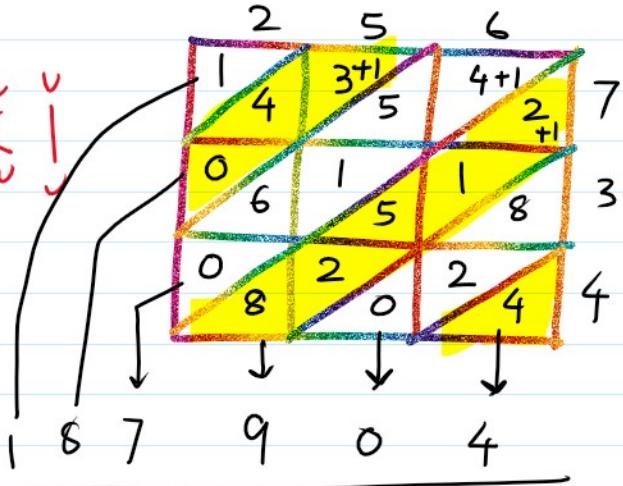
$$\begin{array}{r} & 1 & 2 & 3 \\ & 4 & 5 & 6 \\ \hline 5 & 6 & 0 & 8 & 8 \\ & & & & \end{array} \quad \begin{array}{l} x \\ \times \\ 2 \\ \hline \end{array}$$

$$175 \times 216$$

$$\begin{array}{r} 175 \\ \times 216 \\ \hline 37800 \end{array}$$

382

$$\begin{array}{r}
 256 \\
 \times 734 \\
 \hline
 187904
 \end{array}$$



1) ~~$765 \times 432 = 330480$~~

2) $875 \times 273 = 238875$

3) $074 \times 576 = 561024$

4) $812 \times 217 = 176204$

5) $953 \times 785 = 748105$

3×2

7	9	3
4	5	1
2	6	8

5 3 | 3 | 1

$$\begin{array}{r}
 793 \\
 \times 67 \\
 \hline
 53131
 \end{array}$$

✓ 8
- 11

$$\begin{array}{r}
 & 9 \swarrow 7 \\
 1 & \\
 \hline
 81 & 49 \\
 12 & 6x \\
 \hline
 9409
 \end{array}$$

$$63 \text{ double if } \rightarrow 126$$

1917

$$133 \rightarrow 266$$

$$\begin{array}{r} 36149 \\ 2660 \\ \hline 38809 \end{array}$$

$$\begin{array}{r} 44181 \\ - 378 \\ \hline 47961 \end{array}$$

$$\begin{array}{r} 260149 \\ \underline{-714} \\ \hline 267289 \end{array}$$

$$117 \xrightarrow{2} 13689$$

$$\begin{array}{r} 437^2 \\ \rightarrow \\ 184949 \\ 602 \end{array}$$

$$\begin{array}{r} 986149 \\ 1386 \\ \hline 994009 \end{array}$$

$$99\overline{7} \rightarrow 994009$$

190969

Cubing of nos (CI)

$$\begin{array}{r}
 1 - 1 \\
 2 - 8 \\
 3 - 27 \\
 4 - 64 \\
 5 - 125
 \end{array}$$

6	—	216
7	—	343
8	—	512
9	—	729
10	—	1000

11 — 1331
12 — 1728
13 — 2197
14 — 2744
15 — 3375

$$\begin{array}{r} 26 \\ \times 31 \\ \hline 8000 \\ - 9261 \\ \hline 8000 \end{array}$$

Division

$$197) \overline{218.93} \quad (\underline{\underline{111.132}})$$

(+3) \downarrow
 $200) \overline{218.93} \quad (\underline{109.45})$

$$21) \overline{547} \quad (\underline{\underline{26.047}})$$

$$0 - 4 = 0$$

$$5 - 9 = .10$$

$$\begin{array}{r} 42 \\ 127 \\ \hline 126 \\ \hline 100 \\ 84 \\ \hline 160 \end{array}$$

$$26.047$$

$$44.5 \approx 45$$

$$44.4 \approx 44$$

$$24) \overline{556} \quad (\underline{\underline{27.3}})$$

$$\begin{array}{r} 4 \\ 15 \\ \hline 14 \end{array}$$

$$2379) \overline{847593} \quad (Q, \underline{\underline{356.281}})$$

$$2499) \overline{847666} \quad (\underline{\underline{353.16}})$$

$$\begin{array}{r} 72 \\ 127 \\ \hline 120 \\ \hline 76 \\ 72 \\ \hline 40 \\ 24 \\ \hline 160 \end{array}$$

$$18) \underline{90} (5$$

$$26) \underline{96} (4.5$$

Divisor Dividend Quotient
 211024 211024 211024

Remainder
 0708

$$21) \underline{168} (8$$

$$26) \underline{168} (8.4$$

Less none

$$99^2 = 9801$$

$$9801$$

$$25^2 = 625$$

$$26^2 - 24^2 = 100$$

$$27^2 - 23^2 = 200.$$

$$28^2 - 22^2 = 300$$

$$29^2 - 21^2 = 400$$

$$30^2 - 20^2 = 500.$$

$$49^2 - 49^2 = 2900$$

$$50^2 - 0^2 = 2500$$

$$51^2 - (-1)^2 = 2600$$

AVERAGE

What is Average? (Mean Value of a set of Numbers.)

$$\text{Avg} = \frac{\text{Sum of all observations}}{\text{Total no. of Observations.}}$$

$\text{Avg} = \frac{\text{sum of all observations}}{\text{Total no. of observations.}}$

12, 13, 17, 18, 20

$$\text{Avg} = \frac{12 + 13 + 17 + 18 + 20}{5} = \frac{80}{5} \text{ } 16$$

(12) 16 (20)

* Average always lies between smallest and largest observation

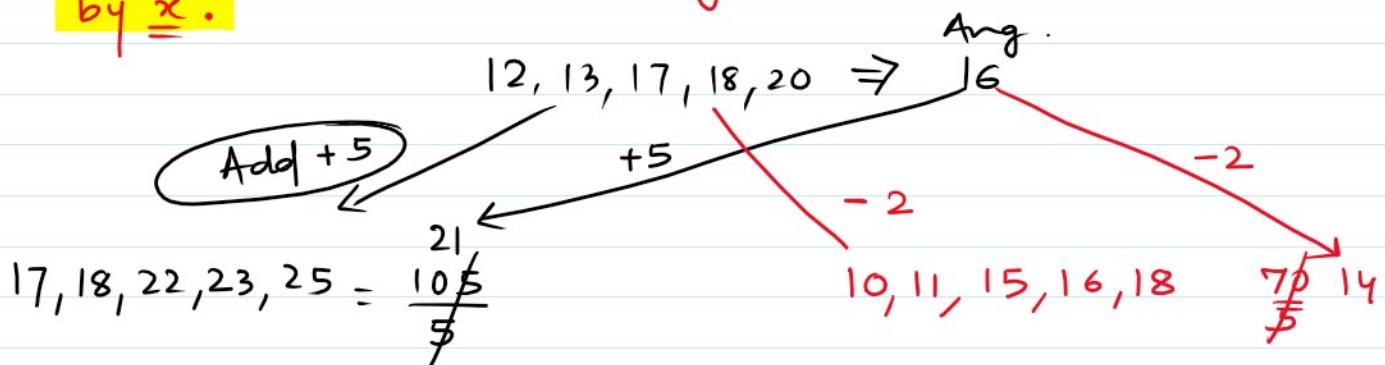
$$16, 16, 16, 16, 16 = \frac{80}{5} \text{ } 16$$

Smallest observation \leq Average \leq largest observation

$$12 < 16 < 20 \\ 16 = 16 = 16$$

1. Average is increased or decreased by $\pm x$. If

Each of observation is being increased or decreased by $\pm x$.



2. Average is multiplied or divided by $\pm x$, if each observation is being multiplied or divided by $\pm x$.



$$\begin{array}{ccccccccc}
 & & \times 2 & & \times 2 & & \div 4 & & \div 4 \\
 & & 24, 26, 34, 36 & 40 & & 160 & 32 & 3, 3.25, 4.25, & 4.5, 5 \\
 & & \cancel{\$} & & & \cancel{\$} & & \cancel{\$} & \cancel{\$} \\
 & & & & & & & 20 & 4 \\
 & & & & & & & \cancel{\$} & \cancel{\$} \\
 & & & & & & & & \\
 & & 48, 52, 68, 72 & 80 & 320 & 64 & & & \\
 & & \cancel{\$} & & \cancel{\$} & & & & \\
 \end{array}$$

A Bats man

10, 17, 23, 29, 41, 50, 0, 100, 99, 01.

Assumed Average = 20

$$\begin{array}{r} \textcircled{20}) \\ -16 -13 +3 +9 +21 +36 -26 +80 +74 -41 \\ \hline +170 \\ \hline 10 \end{array}$$

Observation 20 - 40

$$\begin{array}{r} 1025 \\ \times 40 \\ \hline 40 \end{array}$$

~~$\frac{11.9}{10}$~~

1, 3, 5, 7, 8, 10, 15, 12, 25, 33

~~-6 -4 -2 0 × 3 8 ≠ 18 26~~

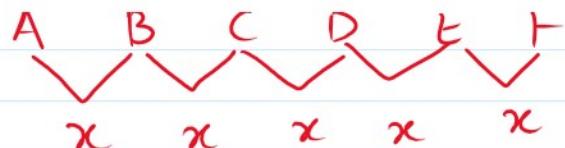
~~$\frac{49}{10}$~~ 4.9

What is a set of continuous numbers?

A red zigzag line with six peaks labeled A, B, C, D, E, and F from left to right.

natural nos set

1, 2, 3, 4, 5, 6 . . .

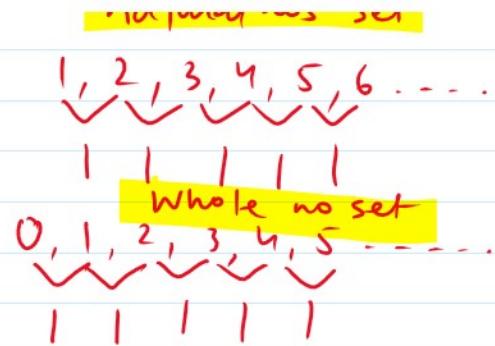


Odd no. set

$$\begin{matrix} 1 \\ \sqrt{ } \\ 3 \\ \sqrt{ } \\ 5 \\ \sqrt{ } \\ 7 \\ \sqrt{ } \\ 9 \end{matrix} \dots$$

Even no. set

$$\begin{matrix} 2 \\ \sqrt{ } \\ 4 \\ \sqrt{ } \\ 6 \\ \sqrt{ } \\ 8 \\ \sqrt{ } \\ 10 \end{matrix} \dots$$



A multiple of any no.

$$\begin{matrix} 7 \\ \sqrt{ } \\ 14 \\ \sqrt{ } \\ 21 \\ \sqrt{ } \\ 28 \\ \sqrt{ } \\ 35 \\ \sqrt{ } \\ 42 \end{matrix} \dots$$

7, 14, 21, 28, 35, 42, 49.

$$\text{Avg} = \frac{7+14+21+28+35+42+49}{7} = 28$$

$$\text{Avg} = \frac{F+L}{2} = \frac{7+49}{2} = \frac{56}{2} = \underline{\underline{28}}$$

Avg = Middle no (observation)

find Avg of numbers from 201 — 999

$$\frac{201+999}{2} = \frac{1200}{2} = \underline{\underline{600}}$$

1. Find the average of 1, 2, 3,50?

$$\frac{1+50}{2} = \frac{51}{2} = \underline{\underline{25.5}}$$

2. Find the average of all even numbers from 1-100

$$\frac{2+100}{2} = \frac{102}{2} = \underline{\underline{51}}$$

7 + 98 = 105

1-100

2 3

3. Find the average of all odd numbers from 1-100? $\underline{50}$

$$\frac{2+98}{2} = \frac{100}{2} = 50$$
$$\frac{1+99}{2} = \frac{100}{2} = 50$$

4. Find the average of first 6 multiples of 8? $\underline{28}$

$$8, 16, 24, 32, 40, 48$$

5. Find the average of first 9 multiples of 7?

$$\frac{8+48}{2} = \frac{56}{2} = 28$$

$$\frac{\underline{7}+\underline{63}}{2} = \frac{70}{2} = 35$$

6. Find the average of all the multiples of 7 from 1-100?

$$\leftarrow \frac{7+98}{2} = \frac{105}{2} = 52.5$$

7. Find the average of all the multiples of 7 from 1-1000?

$$\frac{7+994}{2} = \frac{1001}{2} = 500.5$$

8. If the average of first 6 multiples of a number is 28 then find the number? $\underline{8}$

$$28 = \frac{x+6x}{2} \Rightarrow 56 = 7x$$

9. If the average of first 8 multiples of a number is 54 then find the number? $\underline{12}$

$$(x, 2x, 3x, 4x, 5x, 6x)$$

$$9x = 54 \times 2$$

$$\frac{x+8x}{2} = 54$$

10.

10. If the average of first 6 multiples of a number is 31.5 then find the number? $\underline{9}$

$$\frac{x+6x}{2} = 31.5$$

$$7x = 63$$

11. If the average of 5 consecutive natural numbers is 37 then find the highest number? $\underline{39}$

$$x, x+1, x+2, x+3, x+4$$
$$35 \ 36 \ 37 \ 38 \ 39$$

12. If the average of 7 consecutive natural numbers is 52 then find the product of first &

$$x, x+1, x+2, x+3, x+4, x+5, x+6$$

numbers is 52 then find the product of first & last?

$$49 \times 55 = \underline{2695}$$

$x, x+1, x+2, x+3, x+4, x+5, x+6$
 ↓
 49 50 51 52 53 54 55

13. If the average of 6 consecutive natural no. is 23.5, find the first number? $x, x+1, x+2, x+3, x+4, x+5$

14. If the average of 4 consecutive even no. is 25 then find the last number? 28

15. If the average of 5 consecutive odd numbers is 37 then find the highest number? 41

$$\begin{array}{cccccc} x & + & x+2 & & x+4 & x+6 & x+8 \\ & & & \downarrow & & & \\ 33 & & 35 & & 37 & 39 & 41 \end{array}$$

$$\frac{x+x+5}{2} = 23.5$$

$$2x+5 = 47$$

$$2x = 42 \quad 21$$

$$x, x+2, x+4, x+6$$

$$\frac{x+x+6}{2} = 25$$

$$2x+6 = 50$$

$$2x = 44 \quad 22$$

1. The average age of 11 players in the team is 25 years; if the age of coach is included the average becomes 27 years find the age of coach?

$$\begin{array}{c} p+c = 324 \\ \cancel{\text{Player}} = \underline{275} \\ \hline c = \underline{\underline{49}} \text{ yrs} \end{array}$$

No	×	Avg	→	Total
old no 11		old Avg 25	→	275
new no 12		old Avg 27	→	324

COACH = New Avg + (change in Avg) × old obs.

$$27 + (+2) \times 11 = 27 + 22 = \underline{\underline{49}}$$

Age = New Avg + (change in Avg) × old obs.

$$\begin{array}{ccc} \text{No} & \text{Avg} & \\ 15 & 20 & \\ \hline & & \\ & 14 & 19 \end{array}$$

$$20 + (+1) \times 14 = 34.$$

$$19 + (-1) \times 15 = 19 - 15 = 0$$

2. The batting average of Rahul for 17 innings was 50 runs how much he should score in his next innings so that his average becomes 56?

$$\begin{array}{r} 17 \text{ --- } 50 \\ 18 \text{ --- } 56 \end{array}$$

$$56 + (+6 \times 17)$$

$$56 + 102 = \underline{\underline{158}}$$

3. A group of 6 members has an average weight of 65 kg's. If 1 new member joins the group the average weight will become 62 kg's. Find the weight of new member. 44

$$\begin{array}{r} 6 \text{ --- } 65 \text{ --- } 390 \\ 7 \text{ --- } 62 \text{ --- } 434 \end{array}$$

$$62 + (-3 \times 6) \quad \underline{\underline{44}}$$

$$62 - 18 = \underline{\underline{44}}$$

4. A class of 12 students have the average score of 55 marks if topper leaves the class, the average of the class becomes 52 find the marks of the topper

No. should always
be in
ascending
order
Less
More

~~$$52 - 3 \times 12$$~~
~~$$52 - 36 = 16$$~~

Rearrange

$$\begin{array}{r} 12 \text{ --- } 55 \rightarrow 660 \\ 11 \text{ --- } 52 \rightarrow -572 \\ \hline 88 \end{array}$$

$$11 - 52$$

$$12 - 55$$

$$55 + 3 \times 11 = 55 + 33 = \underline{\underline{88}}$$

5. The average score of 9 players in the team is 20 runs, if the score of Virat and Rohit is also added, the average score of team becomes 30

$$\begin{array}{r} 9 - 20 = 180 \\ 11 - 30 = 330 \\ \hline V+R \rightarrow 150 \end{array}$$

So if the score of Virat and Rohit is also added, the average score of team becomes 30 runs find the score of Virat, if Rohit scored 50 runs in that match?

1. The average of 11 numbers is 63, if the average of first 6 numbers is 60 and last 6 numbers is 65 then find the 6th number?

2. The average temperature of 1 week is 39, if the average temperature of first 4 days is 42 and last 4 days is 38 then finds the temperature on 4th day?

$$\underline{47^{\circ}\text{C}}$$

3. The averages of 10 numbers is 15, if the average of first 7 numbers is 18 and last 4 numbers is 12 then find the 7th number?

$$\underline{\underline{24}}$$

$$10 - 15 = 150$$

$$\begin{array}{r} 7 - 18 = 126 \\ 4 - 12 = 48 \\ \hline 174 - 150 \end{array}$$

1. The average weight of group of 10 people is 63 kg if a new person whose weight is 77kg replaces a person in a group whose weight is 57kg then find the new average weight of group?

$$\frac{+77 - 57}{10} = \frac{+20}{10}$$

2. The average age of group of 14 people is 27 years if a new person whose age is 16 years replaces a person in a group whose age is 30

$$\begin{array}{r} 11 - 30 = 330 \\ V + R \rightarrow 150 \\ 100 + 50 \end{array}$$

$$11 - 63 \rightarrow \underline{\underline{693}}$$

$$\begin{array}{r} 6 - 60 = 360 \\ 6 - 65 = 390 \\ \hline 750 \end{array}$$

$$750 - 693 = \begin{array}{l} 57 \\ 6^{th} \end{array}$$

$$\begin{array}{r} 7 - 39 = 273 \\ 4 - 42 = 168 \\ 4 - 38 = 152 \\ \hline 320 > 320 \end{array}$$

$$320 - 273 =$$

$$10 - 63 = 630$$

$$\begin{array}{r} +77 \\ -57 \\ \hline 650 \end{array}$$

$$10 \quad \frac{650}{10} \quad \frac{650}{10}$$

$$63 + 2 = \underline{\underline{65}}$$

$$\frac{+16 - 30}{14} = \frac{-14}{14} = -1$$

years in a new person whose age is 14 years replaces a person in a group whose age is 30 years then find the new average age of group?

$$14 - 27 \rightarrow \begin{array}{r} 378 \\ + 6 \\ - 30 \\ \hline 354 \end{array}$$

3. The average score of group of 9 students is 60 marks later it was realized that a student whose actual score is 36 has been taken as 63 by mistake find the actual average score of group?

$$9 - 60 = 540 \quad \begin{array}{r} 57 \\ + 36 \\ - 63 \\ \hline 513 \end{array}$$

4. The average score of group of 10 students is 55 marks later it was realized that two students whose actual scores are 50 and 65 has been taken as 60 and 40 by mistake find the actual average score of group?

1. The average of 20 numbers is 30 & another 30 numbers is 20. Find the average of all 50 numbers 24

2. The average score of 9 students of class A is 68 while the average score of 8 students of class B is 51, find the average score of both the class combined together

3. The average weight of 32 boys of class X is 60kg while the average weight of 40 boys of class Y is 33kg, find the average weight of both the class combined together

$$\frac{+16 - 30}{14} = \frac{-14}{14} = -1$$

$$27 - 1 = \underline{\underline{26}}$$

$$\frac{+36 - 63}{9} = \frac{-27}{9} = -3$$

$$60 - 3 = \underline{\underline{57}}$$

$$\frac{10}{50} + \frac{5}{65} = \frac{60 - 40}{10}$$

$$\frac{+15}{10} = \underline{\underline{1.5}}$$

$$55 + 1.5 = \underline{\underline{56.5}}$$

$$\begin{array}{r} 20 - 30 = 600 \\ 30 - 20 = 600 \\ \hline 50 \end{array} \quad \begin{array}{r} 1200 \\ 60 \\ \hline 24 \end{array}$$

$$\begin{array}{r} 9 - 68 = 612 \\ 8 - 51 = 408 \\ \hline 17 \end{array} \quad \begin{array}{r} 60 \\ 1020 \\ \hline 17 \end{array}$$

$$\frac{32 \times 60 + 40 \times 33}{72}$$

$$1920 + 1320$$

both the class combined together

$$\begin{array}{r} 1920 + 1320 \\ \hline 72 \end{array}$$

~~$$\begin{array}{r} 3240 & 405 & 45 \\ \hline 72 & 9 & \end{array}$$~~

4. In a month of 30 days starting with Sunday, the average number of visitors in a library on a normal day is 240 while on Sunday it is 510 find the average number of visitors in a library for the whole month

S	M	T	W	Th	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15						
22						
29						

$$\begin{array}{r} 5 - 510 = 2550 \\ 25 - 240 = 6000 \\ \hline 30 \end{array}$$

\downarrow

$$\frac{8550}{30}$$

1. 7 friends went to a hotel for meal. 6 of them spends 60 rupees each while 7th person spends 120 more than average bill. Find the average bill and also find the total bill amount

$$80 \qquad \qquad \qquad 560$$

$$(60 + 60 + 60 + 60 + 60 + 60 + 60)$$

$$360$$

$$\text{Average bill} = x \text{ Rs}$$

$$7^{\text{th}} = x + 120$$

$$360 + x + 120$$

$$\frac{480 + x}{7} = x$$

$$480 + x = 7x$$

$$a, b, c \qquad \text{Avg} = \frac{a+b+c}{3}$$

$$\text{Average bill} = \underline{\underline{80}}$$

$$\begin{aligned} \text{Total Bill} &= 80 + 480 \\ &= \underline{\underline{560}} \end{aligned}$$

$$a \ b \ c \text{ Avg} = \frac{a+b+c}{3}$$

$\searrow A.M = \frac{a+b+c}{3}$

$$\frac{3^{30} + 3^{60} + 3^{90}}{3}$$

$$a^m \times a^n = a^{m+n}$$

$$\underline{3^{29} \times 3^1} = 3^{30}$$

$$\frac{\underline{3^{29} \times 3^1 + 3^{59} \times 3^1 + 3^{89} \times 3^1}}{\underline{3^1 (3^{29} + 3^{59} + 3^{89})}} =$$

3. The average temperature on Monday, Tuesday, Wednesday is 32 while on Tuesday, Wednesday & Thursday it is 30, if the temperature on Thursday is 26 then find the temperature on Monday?

$$\frac{M + T + W}{3} = 32$$

$$M + T + W = 96^\circ C$$

$$\frac{T + W + Th}{3} = 30$$

$$T + W + Th = 90^\circ$$

$$M - Th = 6^\circ$$

$$32 - 26 = 6^\circ$$

4. The average weight of A, B & C is 84 kg when D joins them then there average weight becomes 80 kg, if E whose weight is 3 kgs more than D, replace A then the average weight of B, C, D & E becomes 79 kg find the weight of A.

$$\frac{A+B+C}{3} = 84 \Rightarrow A+B+C = 252 \quad (1)$$

$$\frac{A+B+C+D}{4} = 80 \Rightarrow A+B+C+D = 320 \quad (2)$$

$$\frac{B+C+D+E}{4} = 79 \Rightarrow B+C+D+E = 316 \quad (3)$$

$$D = 68$$

$$E = (71)$$

$$\begin{array}{r}
 A + B + C + D = 320 \\
 B + C + D + E = 316 \\
 \hline
 A - E = 4
 \end{array}$$

$$\begin{array}{l}
 A - 71 = 4 \\
 A = 75
 \end{array}$$

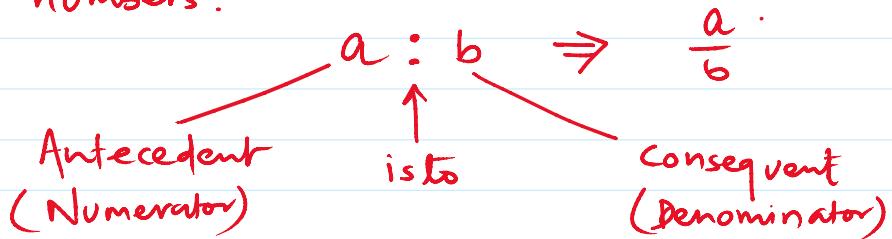
5. Of three numbers first is twice the second and second is twice the third if the average of these 3 numbers is 21 then find the smallest number amongst them

$$\begin{array}{cccc}
 & 1 & 2 & 3 \\
 & 4x & 2x & x \\
 \hline
 & 36 & 18 & 9
 \end{array}$$

$$\begin{array}{l}
 \frac{4x+2x+x}{3} = 21 \\
 7x = 21 \times 3 \\
 x = 9
 \end{array}$$

{ RATIO AND PROPORTION }

What is ratio? \rightarrow It is division (comparison) of 2 or more numbers.



* 1. Ratio must never have any unit.

$$3 \text{ km} : 2 \text{ km} = \frac{3 \text{ km}}{2 \text{ km}}$$

2. A Ratio never changes its value if it is multiplied or divided by same no.

$$(3:2) \times 4 \quad 12:8$$

$$1.5 \quad \frac{3}{2} \quad = \quad \frac{12}{8} \quad 1.5$$

3. Value of Ratio always changes when it is added or subtracted by same no.

3. Value of Ratio always changes when it is added or subtracted by same no.

$$(3:2) + 1 \quad \frac{3}{2} \quad \frac{4}{3}$$

$\left(\begin{matrix} & \\ 1.5 & \end{matrix} \right) 1.33$

$$\begin{array}{cccc} \frac{2}{5} & \frac{3}{6} & \frac{4}{7} & \frac{5}{8} \\ | & & & \\ 0.4 & 0.5 & 0.57 & 0.62 \end{array}$$

If $A:B = 2:3$ $\frac{A^2+B^2}{A^2-B} = ?$ $\frac{4+9}{4-3} = \frac{13}{1}$

$\left(\frac{2A+3B}{4A-3B} = \frac{4+9}{8-9} = \frac{13}{-1} \right) \underline{\underline{13:1}}$

$$\frac{2A+3B}{4A-3B} = \frac{4+9}{8-9} = \frac{13}{-1} \quad - (13:1)$$

If $A:B = 2:3$ $B:C = 4:5$

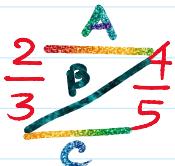
find $A:B:C = ?$ OR $A:C = ?$

$$\frac{A}{B} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12}$$

$$\underline{\underline{A:B:C = 8:12:15}}$$

$$\frac{B}{C} = \frac{4 \times 3}{5 \times 3} = \frac{12}{15}$$

$$\underline{\underline{A:C = 8:15}}$$



If $A:B = 2:3$ $B:C = 4:5$ $C:D = 3:4$

$A:B:C:D = ?$

L R C D

$$A:B:C:D = ?$$

$$\frac{A}{B} = \frac{2}{3}$$

$$\begin{array}{cccc} A & B & C & D \\ 8 & 12 & 15 & 20 \\ (3:4) \times 5 \\ 15:20 \end{array}$$

$$\frac{B}{C} = \frac{4}{5}$$

$$\begin{array}{cccc} A:B:C:D \\ 8 & 12 & 15 & 20 \end{array}$$

$$A = 2 \times 4 \times 3$$

$$\begin{array}{cccc} 2 & 4 & 3 & A \\ \hline 3 & 5 & 4 & D \end{array}$$

$$B = 3 \times 4 \times 3$$

$$\begin{array}{cccc} 2 & 4 & 3 & B \\ \hline C & 5 & 4 & \end{array}$$

$$C = 3 \times 5 \times 3$$

$$D = 3 \times 5 \times 4$$

1. A and B are in the ratio 2:3 if sum of A & B is 35 find the values of A & B 14, 21

$$\frac{A}{B} = \frac{2x}{3x} = \frac{2 \times 7}{3 \times 7} = \frac{14}{21}$$

2. A and B are in the ratio 3:8 if the difference between B & A is 45 then find the smaller number amongst them 27

3. The ratio of salaries of A,B and C is 5:2:4 if A's salary is 6000 more than B's salary Find the sum of salaries of A,B & C 22000

4. The ratio of present ages of Father and son is 4:1 if product of their ages is 196 Find the ratio of their ages after 5 years from now

$$\underline{\underline{11:4}}$$

$$\begin{array}{ccc} 3x & 8x & 8x - 3x = 45 \\ \downarrow & & \\ 27 & & \end{array}$$

$$\begin{array}{c} 8x = 45 \\ x = 5 \end{array}$$

$$= 22k$$

$$\begin{array}{l} 5x - 2x = 6000 \\ 3x = 6000 \\ x = 2000 \end{array}$$

F S

$$4x \times 1x = 196$$

$$4x^2 = 196$$

$$x = 7$$

$$\begin{array}{cc} \text{Father} & \text{Son} \\ 28 & 7 \\ \hline & \end{array}$$

$$4x = 40 \rightarrow$$

$$x = 7$$

$$\begin{array}{r} 28 \\ 33 : 12 \\ \hline 11 : 9 \end{array}$$

5. If $P:Q=2:1$ then find $\frac{P^2-Q^2}{P^2+Q^2}$ $\rightarrow \frac{4-1}{4+1} = \frac{3}{5}$

6. If $A:B=7:3$ then find $\frac{3a-5b}{2a+3b}$ $\rightarrow \frac{21-15}{14+9} = \frac{6}{23}$

7. If $X:Y=3:4$ then find $\frac{7x+3y}{7x-3y}$ $\rightarrow \frac{21+12}{21-12} = \frac{33}{9} = \frac{11}{3}$

8. If $A:B:C = 2:3:4$ then find $\frac{A}{B} : \frac{B}{C} : \frac{C}{A}$ $\frac{2}{3} : \frac{3}{4} : \frac{4}{2} = ?$

$$2 \overline{)3,4,2} \\ 3,2,1$$

$$\left(\frac{2}{3} : \frac{3}{4} : \frac{4}{2} \right) \times 12$$

$$\cancel{\frac{24}{3}} : \cancel{\frac{36}{4}} : \cancel{\frac{48}{2}}$$

$$\underline{\underline{8 : 9 : 24}}$$

1. If $a:b=2:3$ and $b:c=4:5$ find $a:b:c?$ $\rightarrow 8:12:15$

$$\cancel{\frac{2}{3}} \cancel{\frac{3}{5}}$$

2. If $a:b=1:2$ and $b:c=3:4$ and $c:d=5:6$ find $a:b:c:d?$ $15:30:40:48$

$$\frac{1}{2} \quad \frac{3}{4} \quad \frac{5}{6}$$

3. If $a:b=\frac{1}{2}:\frac{3}{5}$ and $b:c=\frac{2}{3}:\frac{5}{4}$ find $a:b:c?$ $\rightarrow 20:24:45$

4. If $2a=3b=4c$ find $a:b:c?$

$2a = 3b = 4c = k$

$$a = \frac{k}{2}$$

$$\left(\frac{k}{2} : \frac{k}{3} : \frac{k}{4} \right) \times 12$$

$$\cancel{\frac{1}{2}} \cancel{\frac{3}{5}}$$

$$\cancel{\frac{2}{3}} \cancel{\frac{5}{4}}$$

$$5:6$$

$$8:15$$

$$\cancel{\frac{5}{6}} \cancel{\frac{8}{15}}$$

$$\cancel{40} : \cancel{48} : \cancel{96}$$

$$\underline{\underline{20:24:45}}$$

$$a = \frac{k}{2}, b = \frac{k}{3}, c = \frac{k}{4}$$

$$\left(\frac{k}{2} : \frac{k}{3} : \frac{k}{4} \right) \times 12$$

$$\cancel{12k} : \cancel{\frac{k}{3}} : \cancel{\frac{12k}{4}}$$

$$6 : 4 : 3$$

$$2 | \underline{2, 3, 4}$$

$$1, 3, 2$$

5. The sum of three numbers A, B & C is 98 If ratios of A & B is 2 : 3 & that of B & C is 5:8 then find B?

$$\frac{2}{3} \begin{matrix} \nearrow 5 \\ \searrow 8 \end{matrix}$$

$$A : B : C$$

$$10x + 15x + 24x = 98$$

$$49x = 98 \quad | : 49$$

$$x = 2$$

$$15x = 30$$

6. If ratios of salaries of A & B as well as B & C is 4:5 and A is earning 18000 rupees less than C find the salary of B?

$$A : B : C$$

$$16x \quad 20x \quad 25x$$

$$\frac{4}{5} \begin{matrix} \nearrow 4 \\ \searrow 5 \end{matrix}$$

$$25x - 16x = 18000$$

$$9x = 18000 \quad | : 9$$

$$x = 2000$$

$$20x = 2000 \times 20$$

$$40000$$

{PROPORTION}

What is Proportion? \rightarrow Proportion is equality of 2 Ratios.

$$A : B :: C : D \Rightarrow \frac{A}{B} = \frac{C}{D} = \boxed{AD = BC}$$

A is to B as C is to D

A & D = Extreme Term

A \rightarrow First term of Proportion
 - - C - - - - - D \rightarrow Second term of Proportion

$A \& D =$ Extreme Term
 $B \& C =$ Mean Terms

$A \rightarrow$ First term of Proportion
 $B \rightarrow$ Second term of Proportion
 $C \rightarrow$ Third term of Proportion
 $D \rightarrow$ Fourth Term of Proportion

$$\boxed{AD = BC}$$

$$A = \frac{BC}{D} \quad B = \frac{AD}{C} \quad C = \frac{AD}{B} \quad D = \frac{BC}{A}$$

If $A : B :: C : D = 2 : 3 :: ? : 9$

$$2 : 3 :: ? : 9$$

$$\frac{2}{3} = \frac{?}{9}$$

$$? = \frac{9 \times 2}{3} = 6.$$

$\begin{matrix} 2 & \xrightarrow{\text{X1.5}} & ? \\ \text{X1.5} & & \text{1.5} \end{matrix}$

1. In a 50 liters of milk & water solution, the ratio of milk & water is 3:2. If 5 liters of water is added to the mixture then find the new ratio of milk & water in the solution

50

$$\begin{matrix} M & W \\ 30 & 20 \\ & +5 \end{matrix}$$

$$\begin{matrix} 30 & : & 25 \\ & & \underline{6 : 5} \end{matrix}$$

$$\begin{matrix} M : W \\ 3x : 2x \end{matrix}$$

$$3x = 50$$

2. 80 liters of spirit & water solution consist of spirit & water in ratio 11:5. If 20 liters of spirit is added to the mixture, then find the new ratio of spirit & water in the solution

$$\underline{3:1}$$

$$\begin{matrix} S & W \\ 11x & 5x \\ 16x & = 80 \end{matrix}$$

$$\begin{matrix} S & W \\ 55 & 25 \end{matrix}$$

of spirit & water in the solution $3:1$

$$\begin{array}{r}
 S \quad W \\
 55 \quad 25 \\
 +20 \\
 \hline
 75 \quad 35 \\
 3 : 1
 \end{array}$$

3. In a 24 liters of milk & water solution, the ratio of milk & water is $5:3$. How many liters of water should be added to the initial mixture, so that the resultant solution have milk & water in the ratio $3:5$ 16 ltrs

$$\frac{5+3}{3} = \frac{9+y}{5}$$

$$\begin{array}{l}
 25 = 9+y \\
 \underline{16} = y
 \end{array}$$

$$\begin{array}{r}
 M \quad W \\
 5x + 3x = 24 \\
 8x = 24
 \end{array}$$

$$\begin{array}{r}
 M \quad W \\
 15 \quad 9 \\
 +y \\
 \hline
 3 = \frac{9+y}{5}
 \end{array}$$

$$\frac{5+3}{3} = \frac{9+y}{5}$$

4. A jar contains milk and water in the ratio of $5:6$ if 20 liters of water is added the ratio becomes $1:2$ find the initial quantity of milk and water in the mixture $M=25 \text{ } W=30$

$$\begin{array}{r}
 M \quad W \\
 5x \quad 6x \\
 +20 \\
 \hline
 1 = \frac{3x+10}{2}
 \end{array}$$

$$\begin{array}{l}
 \frac{5x}{1} = \frac{6x+20}{2} \\
 5x - 3x = 10 \\
 2x = 10
 \end{array}$$

5. An alloy contains Zinc and copper in the ratio of $2:3$ if 10kgs of Zinc is added and 25kgs of copper is added the ratio will become $3:5$ find the initial values of Zinc and copper

$$\begin{array}{l}
 Zn = 50 \text{ kg} \\
 Cu = 75 \text{ kg}
 \end{array}$$

$$\begin{array}{r}
 Zn \quad Cu \\
 2x \quad 3x \\
 +10 \quad +25 \\
 \hline
 3 = \frac{5}{5}
 \end{array}$$

$$\begin{array}{l}
 10x + 50 = 9x + 75 \\
 10x - 9x = 75 - 50 \\
 x = 25
 \end{array}$$

1. If the ratio of present ages of A and B is $2:3$ and 6 years later the ratio of their ages will become $7:9$ find their present ages $8;12$

$$\begin{array}{l}
 \text{Present Age} \rightarrow \frac{A}{2x} \quad \frac{B}{3x} \\
 \text{After 6 yrs} \rightarrow \frac{2x+6}{7} = \frac{3x+6}{9}
 \end{array}$$

$$\begin{array}{l}
 18x + 54 = 21x + 42 \\
 \hline
 \end{array}$$

2. If the ratio of present ages of A and B is $3:5$ and 4 years before the ratio of their ages was

2. If the ratio of present ages of A and B is 3:5 and 4 years before the ratio of their ages was 5:9 find their present ages

24; 40

$$\begin{aligned} 18x + 54 &= 21x + 42 \\ 54 - 42 &= 21x - 18x \\ 4x &= 3x \end{aligned}$$

3. If the ratio of present ages of A and B is 2:1 and 8 years later the ratio of their ages will become 3:2 find the ratio of their ages after 20 years from present ages

$$\frac{2x+8}{3} = \frac{1x+8}{2}$$

$$4x + 16 = 3x + 24$$

$$x = 8$$

$$\frac{3x}{5} = \frac{5x-4}{9}$$

$$\begin{aligned} 27x - 36 &= 25x - 20 \\ 2x &= 16 \\ x &= 8 \end{aligned}$$

$$\begin{array}{cc} 16 & 8 \\ 36 & 28 \\ \hline 9 : 7 \end{array}$$

4. If the ratio of ages of A and B 5 years back was 5:7 and after 10 years from now the ratio of their ages will become 4:5 find the ratio of their present ages

30, 40

$$\begin{array}{ll} \text{A} & \text{B} \\ \text{5 yrs back} & 5x \\ \text{Today} & 5x + 5 \\ \text{10 yrs later} & \frac{5x + 15}{4} = \frac{7x + 15}{5} \end{array}$$

$$\begin{aligned} 25x + 75 &= 28x + 60 \\ 3x &= 15 \\ x &= 5 \end{aligned}$$

1. If the ratio of income of A and B is 5:7 and the ratio of their expenditure is 3:5 if both of them saves 2000 each then find their Income

$$\begin{array}{ll} \text{I} & \\ \hline 5x & 7x \\ 3y & 5y \\ \hline 2000 & 2000 \end{array}$$

$$\begin{aligned} 5x - 3y &= 7x - 5y \\ 5y - 3y &= 7x - 5x \\ 2y &= 2x \end{aligned}$$

2. If the ratio of income of A and B is 7:9 and the ratio of their expenditure is 5:6 if A & B saves of them saves 4000 & 6000 respectively then find their Income

$$\begin{aligned} 5x - 3x &= 2000 \\ x &= 1000 \end{aligned}$$

$$x = 1000$$

2. If the ratio of income of A and B is 7:9 and the ratio of their expenditure is 5:6 if A & B saves of them saves 4000 & 6000 respectively then find their Income

$$9(7x - 5y = 4000)$$

$$7(9x - 6y = 6000)$$

$$\begin{array}{rcl} I \rightarrow & 7x & 9x \\ E \rightarrow & \cancel{5y} & 10000 \\ & \hline & 4000 & 6000 \end{array}$$

$$\cancel{63x - 45y = 36000}$$

$$\cancel{63x - 42y = 42000}$$

$$+ 3y = + 6000 \quad 2000$$

3. If the ratio of income & expenditure of A is 9:7 if A saves rupees 6000 then find his income

$$\begin{array}{ccc} 9x & :9 & 27000 \\ 7x & :7 & 21000 \\ \hline 2x & :2 \rightarrow 6000 & \underline{\underline{6000}} \\ & 1 \rightarrow 3000 & \end{array}$$

1. A box contains 180 rupees in the form of 1 rupee, 50 paisa and 25 paisa, the number of coins of 1 rupee, 50 paisa and 25 paisa are in the ratio 2 : 3 : 4 Find the number of 50 paisa coins

$$\begin{array}{cccc} 100 & 50 & 25 \\ 2x & 3x & 4x \\ \hline 200x + 150x + 100x \end{array}$$

$$\cancel{450x} = \cancel{180} \times \cancel{100} \frac{2}{4}$$

$$x = 40$$

$$\begin{array}{l} 1 \times 80 = 80 \\ \frac{1}{2} \times 120 = 60 \\ \frac{1}{4} \times 160 = 40 \end{array}$$

$$3 \times 40 = \underline{\underline{120}}$$

$$\begin{array}{cccc} 1 & 50 & 25 \\ 2x & 3x & 4x \\ \hline 2x + 1.50x + 1.00x = 180 \end{array}$$

$$\begin{array}{l} 4.50x = 180 \\ x = \frac{180}{4.50} \times \frac{2}{2} \end{array}$$

~~प्र० यद्युमि - विषयीय~~

$$\underline{x = 40}$$

$$3 \times 40 = 120 \text{ coins} \checkmark$$

$$x = \frac{\frac{20}{100} \times 100}{\frac{4650}{9}} \cdot 2$$

2. A box contains 372 rupees in the form of 1 rupee, 50 paisa and 25 paisa, the number of coins of 1 rupee, 50 paisa and 25 paisa are in the ratio 3 : 8 : 20 Find the total number of coins

$$31x = 31 \times 31 \\ \underline{= 961 \text{ coins}}$$

$$\begin{array}{r} 1 \quad \cdot 50 \quad \cdot 25 \\ 3x \quad 8x \quad 20x \\ \hline 372 = 3x + 4.00x + 5.00x \\ 11x = 372 - 31 \end{array}$$

3. A box contains 90 rupees in the form of 50 paisa, 25 paisa and 10 paisa, the number of coins are in the ratio 2 : 3 : 5 Find the number of 25 paisa coins

$$\cancel{3 \times 40 = 120 \text{ coins}}$$

$$\begin{array}{r} \cdot 50 \quad \cdot 25 \quad \cdot 10 \\ 2x \quad 3x \quad 5x \\ \hline 1.00x + 0.75x + 0.50x = 90 \end{array}$$

$$\underline{x = 40}$$

$$2.25x = 90 \\ x = \frac{90}{2.25} \times \frac{100}{4} \\ \underline{x = 40}$$