Toppersnotes
Unleash the topper in you

GROUP

RAILWAY RECRUITM

QUANTITATIVE

SIERRA INNOVATIONS
Private Limited

EDITION - DEC 2019

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Printed by SIERRA INNOVATIONS PVT. LTD. In India

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MRP - 799/-

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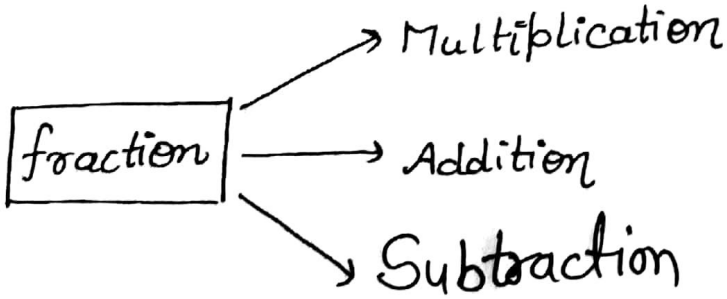
SIMPLIFICATION

* Fraction

1 = 100%	1/11 = 9.09%	3/8 = 37.5%
1/2 = 50%	1/12 = 8.33%	5/8 = 62.5%
1/3 = 33.33%	1/13 = 7.69%	7/8 = 87.5%
1/4 = 25%	1/14 = 7.14%	5/6 = 83.33%
1/5 = 20%	1/15 = 6.66%	11/12 = 91.67%
1/6 = 16.66%	1/16 = 6.25%	
1/7 = 14.28%	1/17 = 5.88%	
1/8 = 12.5%	1/18 = 5.56%	
1/9 = 11.11%	1/19 = 5.26%	
1/10 = 10%	1/20 = 5%	

संजीवनी



राख भी बिकेगी; सोने के भाव, जल कर तो देख

Multiplication form:

(a) $1/7 = 14.28\%$

$\times 1/2$ ↓

$1/14 = 7.14\%$

(b) $1/4 = 25\%$.

$\times 1/2$ ↓

$1/8 = 12.5\%$.

$\times 1/2$ ↓

$1/16 = 6.25\%$.

(c) $1/6 = 16.66\%$.

$\times 1/2$ ↓

$1/12 = 8.32\%$

(d) $1/11 = 9.09\%$.

$\times 2$ ↓

$2/11 = 18.18\%$.

Addition form:

(a) 107.69%.

$\rightarrow 100\% + 7.69\%$.

$= 1 + 1/13 = 1\frac{1}{13}$

(b) 116.66%.

$\rightarrow 100\% + 16.66\%$.

$= 1 + 1/6 = 1\frac{1}{6}$

(c) 137.5%.

$\rightarrow 100\% + 37.5\%$.

$= 1 + 3/8 = 11/8$

(d) 162.5%.

$\rightarrow 100\% + 62.5\%$.

$= 1 + 5/8$

$= 1\frac{5}{8}, \frac{13}{8}$

Substraction form:

(a) 90.91%.

→ 100% − 9.09%.

→ $1 - \frac{1}{11}$

$= \frac{10}{11}$ Ans

(b) 87.5%.

→ 100% − 12.5%.

→ $1 - \frac{1}{8}$

$= \frac{7}{8}$ Ans

(c) 92.86%.

→ 100% − 7.14%.

$1 - \frac{1}{14}$

$= \frac{13}{14}$ Ans

Eg :- 1. 28.56% of 35 + 87.5% of 32 = x

$= (2 \times 1/7) \times 35 + (100\% - 12.5\%) \times 32 = x$

$= \frac{2}{7} \times 35 + (1 - \frac{1}{8}) \times 32$

$= \frac{2}{7} \times 35 + \frac{7}{8} \times 32$

$= 10 + 28 = 38$ Ans

2. 37.5% of 64 + 16.66% of 24 = $\sqrt{729}$ + x

$= 3(12.5\%) \times 64 + (1/6) \times 24 = 27 + x$

$= 3 \times \frac{1}{8} \times 64^{8} + \frac{1}{6} \times 24^{4} = 27 + x$

$= 24 + 4 = 27 + x$

$\boxed{x = 1}$

3. 48% of 2434

50% − 2%

$= 1217 - 48.68$

$= 1168.32$ Ans

100% = 2434

50% = 1217

1% = 24.34

2% = 48.68

4. 45% of 2460

50% − 5%

1230 − 123

= 1107 Ans

100% → 2460

50% → 1230

5% → 123

5. 55% of 525

50% + 5%

262.5 + 26.25

= 288.75 Ans

100% → 525

50% → 262.5

5% = 26.25

6. 26% of 1248

25% + 1%

312 + 12.48

= 324.48 Ans

100% → 1248

25% → $\frac{1}{4} \times 1248 = 312$

1% = 12.48%

7. $67.66\% \text{ of } 3369$

$66.66\% + 1\%$

$2246 + 33.69$

$= 2279.69$ Ans

66.66%

$\rightarrow \frac{2}{3} \times 3369$

$= 2 \times 1123$

$= 2246.$

Brahmastra-2

$x\%$ of $y = y\%$ of x

$\frac{x}{100} \times y = \frac{y}{100} \times x$ Both are Same

How it's works :

*56% of 50

→ 56% of 50 = 50% of 56

↓ Dimag Ko Sochna Padegga.

↓ Kuch bhi nahi Sochna, Direct

$= 28$ Ans.

68 % of 150?

→ 150 % of 68

100 % → 68

50 % → 34 +

102 Ans

90.6 % of 16.67 ?

→ 16.67 % of 90.6

$\frac{1}{6} \times 90.6 = 15.1$ Ans

25.6 % of 250 ?

→ 250 % of 25.6

200 % → 51.2

50 % → 12.8

64.0 = 64 Ans

Addition & Subtraction tricks

Q. I. 4859 + 6424 + 9234

School Method

```
  ①①①
  4859
  6424
+ 9234
-------
 20517 Ans
```

Sarkari Naukri lagane Wala Method

Q. 4859 + 6424 + 9234

4000	800	59	
6000	400	24	
9000	200	34	
19000	+ 1400	+ 117	= 20517

Solve all Calculation in mind, not on pen & paper.

Solve in mind

1. 4600 + 8400 + 7600 = 20,600
2. 3848 + 5238 − 3316 = 5,770
3. 1184 + 1982 − 768 = 2398
4. 2368 + 1464 + 108 − 29 = 3911
5. 49352 + 61264 + 89816 = 1,99,932

Multiplication trick

Multiply by 5

a) eg: 648 × 5

$$\frac{6480}{2} = 3240 \text{ Ans}$$

Helping hand
Multiply by 10 & then devide by 2; in mind not paper.

b) 3224×5

$\rightarrow \frac{32240}{2} = 16120$ Ans.

c) 325×5

$\rightarrow \frac{3250}{2} = 1625$ Ans.

d) 3223×5

$= \frac{32230}{2} = 16115$ Ans.

Multiply by 25

eg: (a) 313×25

$\rightarrow \frac{31300}{4} = 7825$ Ans.

Helping hand:
Multiply by 100 & then divide by 4 in mind.

(b) 1816×25

$\rightarrow \frac{181600}{4} = 45400$ Ans.

(c) 2131×25

$\rightarrow \frac{213100}{4} = 53275$ Ans.

Multiply by 125:

Multiply by 1000 & then divide by 8 in mind.

e.g. (a) 417×125

$\rightarrow \frac{417000}{8} = 52125$ Ans.

(b) 3728×125

$\rightarrow \frac{3728000}{8} = 466000$ Ans.

Do not learn any other tricks for Multiplication

Smart Division Method

Helpful in solving DI.

$\frac{273}{741} \overset{-14}{\approx} \frac{249}{700} \approx .355$

-41 → Nearest 100 Multiple

→ let's call it 42. $3 \rightarrow 42$, $L \rightarrow 14$

→ Ratio of this fraction $\approx \frac{1}{3} \approx \left(\frac{250}{750}\right)$

$\frac{1}{3} \rightarrow \frac{14}{42}$ ⇒ Maintaining Ratio Everywhere.

Helping hand :

a) $\frac{273}{741} \approx \frac{\quad}{700}$

-41

go to the nearest Multiple of 100.

(b) See the ratio of original fraction approximately.

$\frac{250}{750} \approx \frac{1}{3}$

(c) $-41 \approx -42 \Rightarrow$ $\frac{1}{3} \approx \frac{14}{42}$ (×14 above, ×14 below)

(d) $\frac{273}{741} \approx \frac{249}{700}$ (−14 above, −41 below)

(e) divide

(i) $\frac{249}{7} = 35.5$

(ii) $\frac{35 \cdot 5}{100} = .355$

2. $\frac{998}{1437}$

$\rightarrow \frac{998}{1437} \approx \frac{1000}{1400} \approx \frac{5}{7}$

$\frac{998}{1437} \approx \frac{973}{1400} \approx .72$ ($5 \times 5 = -25$ above, -37 below)

$7 \rightarrow 35$

$1 \rightarrow 5$

Calculator showing $\approx .69$.

3. $\frac{537}{884}$

$\rightarrow \frac{5}{8} \approx \frac{537}{884} \approx \frac{553}{900} \approx .601$

(2×8 = +16; +16; 8 → 16, 1 → 2)

Calculator shows ≈ .607

This Method gives us approximale idea than use can calculate data by options easily.

Examples	Calculator results
i) $\frac{937}{1534} \approx .61$	.610
ii) $\frac{1738}{937} \approx 1.85$	1.854
iii) $\frac{2097}{1352} \approx 1.55$	1.55
iv) $\frac{641}{937} \approx .68$	.684

Cube & Cube Root

$1^3 = 1$	$11^3 = 1331$
$2^3 = 8$	$12^3 = 1728$
$3^3 = 27$	$13^3 = 2197$
$4^3 = 64$	$14^3 = 2744$
$5^3 = 125$	$15^3 = 3375$
$6^3 = 216$	$16^3 = 4096$
$7^3 = 343$	$17^3 = 4913$
$8^3 = 512$	$18^3 = 5832$
$9^3 = 729$	$19^3 = 6859$
$10^3 = 1000$	$20^3 = 8000$

* Learn Cube of 1 to 20 for the faster Calculation.

* Trick to find Cube of any number:

Eg. $(12)^3$

(a) Make Cube of 1 & 2.

SQUARES

* Squares of 1-50 :

$1^2 = 1$	$11^2 = 121$	$21^2 = 441$	$31^2 = 961$	$41^2 = 1681$
$2^2 = 4$	$12^2 = 144$	$22^2 = 484$	$32^2 = 1024$	$42^2 = 1764$
$3^2 = 9$	$13^2 = 169$	$23^2 = 529$	$33^2 = 1089$	$43^2 = 1849$
$4^2 = 16$	$14^2 = 196$	$24^2 = 576$	$34^2 = 1156$	$44^2 = 1936$
$5^2 = 25$	$15^2 = 225$	$25^2 = 625$	$35^2 = 1225$	$45^2 = 2025$
$6^2 = 36$	$16^2 = 256$	$26^2 = 676$	$36^2 = 1296$	$46^2 = 2116$
$7^2 = 49$	$17^2 = 289$	$27^2 = 729$	$37^2 = 1369$	$47^2 = 2209$
$8^2 = 64$	$18^2 = 324$	$28^2 = 784$	$38^2 = 1444$	$48^2 = 2304$
$9^2 = 81$	$19^2 = 361$	$29^2 = 841$	$39^2 = 1521$	$49^2 = 2401$
$10^2 = 100$	$20^2 = 400$	$30^2 = 900$	$40^2 = 1600$	$50^2 = 2500$

Trick of Square of any two digit Number

Brahmastra -3

1. $(63)^2$

$\downarrow\downarrow$

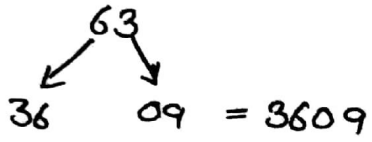
36 09

360 $\rightarrow 6 \times 3 \times 2 \times 10$

3969

Steps

a) write the Square of individual number



b) Multiply the digits

$6 \times 3 = 18$

c) Multiply by 2, than 10

$18 \times 2 = 36 \times 10 = 360$

(d) Add (a) & (c)

$3609 + 360 = 3969$ Ans

2. $(79)^2$

↓ ↓

49 81

12 60 → $7 \times 9 \times 2 \times 10$

6241

3. $(84)^2$

↓ ↓

64 16

640 → $8 \times 4 \times 2 \times 10$

7056 Ans