

# Aptitude Practice

## Time and work

Based on chain Rule

Formula ① :  $\frac{P_1 H_1 D_1}{P_2 H_2 D_2} = \frac{W_1}{W_2}$

(when work is given)

P = No. of person

H = No. of hours

D = No. of days

w = work

Formula ② :  $P_1 H_1 D_1 = P_2 H_2 D_2$

(work not given)

① 15 men can type 3240 pages in 6 days working 2 hrs per day. How many men would be required to type 5400 pages working 4 hrs per day for 3 days?

$$\rightarrow P_1 = 15 \quad P_2 = ?$$

$$W_1 = 3240 \quad W_2 = 5400$$

$$H_1 = 2 \quad H_2 = 4$$

$$D_1 = 6 \quad D_2 = 3$$

$$\frac{P_1 H_1 D_1}{P_2 H_2 D_2} = \frac{W_1}{W_2}$$

$$\frac{15 \times 2 \times 6}{x \times 4 \times 3} = \frac{3240}{5400}$$

$$\left| \begin{array}{l} \frac{15}{x} = \frac{81}{135} \\ x = \frac{135 \times 15}{81} \\ x = 25 \text{ men} \end{array} \right.$$

② If 72 men can build a wall of 280 m length in 21 days how many men could take 18 days to build a similar type of wall of length 100m?

$$\rightarrow P_1 = 72, D_1 = 21, W_1 = 280$$

$$P_2 = ?, D_2 = 18, W_2 = 100$$

$$\frac{P_1 \cancel{H_1} D_1}{P_2 \cancel{H_2} D_2} = \frac{W_1}{W_2}$$

$$\frac{72 \times 21}{x \times 18} = \frac{280}{100}$$

$$\left| \begin{array}{l} \frac{6}{x} = \frac{1}{5} \\ x = 6 \times 5 \\ x = 30 \text{ men} \end{array} \right.$$

③ 39 persons can repair a road in 12 days working 5 hours a day in how many days will 30 persons working 6 hours a day complete the work?

$$\rightarrow P_1 = 39 \quad D_1 = 12 \quad H_1 = 5 \text{ hrs} \quad | \quad P_1 H_1 D_1 = P_2 H_2 D_2 \\ P_2 = 30 \quad D = ? \quad H = 6 \text{ hrs} \quad | \quad \frac{39 \times 5 \times 12}{13} = \frac{30 \times 6 \times x}{x} \quad | \quad x = 13 \text{ days}$$

④ 15 labours complete a work in 10 days working 6 hrs per day, If 18 labours are employed on that work and the work is to be completed in 5 days, then how many hrs per day should the work be continued?

$$\rightarrow P_1 = 15 \quad D_1 = 10 \quad H_1 = 6 \\ P_2 = 18 \quad D_2 = ? \quad H_2 = ?$$

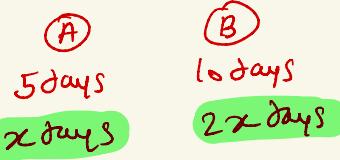
$$P_1 H_1 D_1 = P_2 H_2 D_2 \\ \frac{15 \times 6 \times 10}{5} = \frac{18 \times x \times 5}{2} \quad | : 30 = 10$$

⑤ If 80 person can finish a work within 16 days by working 6 hrs a day, the numbers of hrs a day should 64 persons work to finish that job within 15 days is,

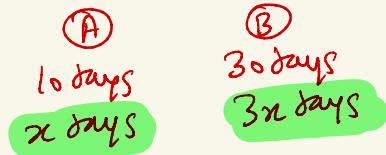
$$\rightarrow \frac{80 \times 16 \times 6}{64} = \frac{64 \times 15 \times x}{15} \quad | x = 8$$

## Work and Efficiency

① A is two times efficient than B



② A is thrice efficient than B



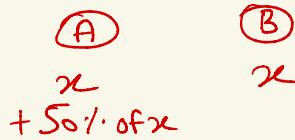
③ A is four times efficient than B



④ A is 50% more efficient than B



⑤ A takes 50% more time than B



Q1) A is twice as good as workman as B and B is twice as good as workman as C. If A and B can together finish a piece of work in 4 days, then C can do it by himself in,

$$\rightarrow (A) (B) (C)$$

$x$  days  $2x$  days  $4x$  days

$x/2$   $x/2$   $4x/6$

$A + B = \frac{1}{4}$

$$\frac{1}{2x} + \frac{1}{2x} = \frac{1}{4}$$
$$\frac{2+1}{2x} = \frac{1}{4}$$

$= 24 \text{ days}$

$$\frac{3}{2x} = \frac{1}{4}$$

$$2x = 6$$

② A and B together can do a work in 12 days. B and C together do it in 15 days. If A's efficiency is twice that of C, then the days required for B alone to finish the work is,

$$\begin{aligned} \rightarrow A + B &= \frac{1}{12} \quad \text{--- ①} \\ - B + C &= \frac{1}{15} \quad \text{--- ②} \\ \hline A - C &= \frac{1}{12} - \frac{1}{15} \\ A - C &= \frac{5 - 4}{60} \\ . \\ A - C &= \frac{1}{60} \end{aligned}$$

(A)  $x$  days      (C)  $2x$  days

Put  $x = 30$  in eq ①

$$A + B = \frac{1}{12}$$

$$\begin{aligned} \frac{1}{x} - \frac{1}{2x} &= \frac{1}{60} \\ \frac{2-1}{2x} &= \frac{1}{60} \\ \frac{1}{2x} &= \frac{1}{60} \\ \boxed{x = 30} \end{aligned} \quad \begin{aligned} \frac{1}{30} + B &= \frac{1}{12} \\ B &= \frac{1}{12} - \frac{1}{30} \\ B &= \frac{5-2}{60} \\ B &= \frac{3}{60} = \frac{1}{20} \end{aligned}$$

$\therefore B = 20$  days

③ Asha and Babu can do a job together in 7 days. Asha is  $1\left(\frac{3}{4}\right)$  times as efficient as Babu. The same job can be done by Asha alone in,

$$\rightarrow \text{Asha} + \text{Babu} = \frac{1}{7}$$

$$\frac{1}{4x} + \frac{1}{7x} = \frac{1}{7}$$

$$\frac{7+4}{28x} = \frac{1}{7}$$

$$\frac{11}{28x} = \frac{1}{7}$$

$$\boxed{x = \frac{11}{4}}$$

Asha      Babu  
 $x$        $1\frac{3}{4}x$  days

$x$        $\frac{7}{4}x$  days

$4x$       7 days

Put  $x = \frac{11}{4}$

$$\begin{aligned} \text{Asha} &= 4x \\ &= 4 \times \frac{11}{4} \end{aligned}$$

$= 11$  days

④ A can do a piece of work in 70 days and B is 40% more efficient than A. The number of days taken by B to do the same work is,

$$\rightarrow \begin{array}{ll} \textcircled{A} & \textcircled{B} \\ 70 & x \\ 140\% & 100\% \end{array} \quad 140\% = 70 \quad x = \frac{10}{70} \times 100 \quad \cancel{\frac{10}{70}} \quad \boxed{x = 50}$$

⑤ To complete a work, A takes 50% more time than B. If together they take 18 days to complete the work, how much time shall B take to do it?

$$\rightarrow \begin{array}{ll} \textcircled{A} & \textcircled{B} \\ x & x \\ +50\% \text{ of } x & \\ 2x + \frac{50}{100}x & x \\ \cancel{\frac{100}{2}} & \\ 2x + \frac{1}{2}x & x \\ \frac{3x}{2} & x \end{array} \quad A + B = \frac{1}{18} \quad B = 2x \\ \frac{1}{3x} + \frac{1}{2x} = \frac{1}{18} \quad = 2 \times 15 \\ \frac{5}{6x} = \frac{1}{18} \quad \boxed{= 30 \text{ days}} \\ x = 15 \quad \boxed{\begin{array}{|c|c|} \hline 3x & 2x \\ \hline \textcircled{A} & \textcircled{B} \\ \hline \end{array}}$$

# Fraction of work

①  $\frac{2}{3}$  work completed by A in 10 days.

$$\textcircled{A} = 15 \text{ days}$$

$$\frac{2}{3} \text{ work done} = 10$$

$$1 \text{ work} = 10 \times \frac{3}{2}$$

$$\Rightarrow 1 \text{ work} = 15 \text{ days}$$

② A completes a piece of work in 20 days.

$$\frac{2}{5} \text{ work done}$$

$$4 \times 20 \times \frac{2}{5} = 8 \text{ days}$$

(a) A can complete  $\frac{2}{3}$  of a work in 4 days and B can complete  $\frac{3}{5}$  of the work in 6 days. In how many days can both A and B together complete the work?

→ A

B

$$\frac{2}{3} \text{ of work} = 4 \text{ days}$$

$$1 \text{ work done by A} = 4 \times \frac{3}{2}$$

Total work

$$\boxed{A = 6 \text{ days}}$$

B

$$\frac{3}{5} \text{ of work} = 6 \text{ days}$$

$$1 \text{ work done by B} = 6 \times \frac{5}{3}$$

Total work

$$\boxed{B = 10 \text{ days}}$$

$$\textcircled{A} + \textcircled{B} = ?$$

$$\frac{1}{6} + \frac{1}{10} \Rightarrow \frac{5+3}{30}$$

$$= \frac{8}{30} \Rightarrow \frac{4}{15} \Rightarrow \boxed{\frac{15}{4} \text{ days}}$$

reciprocal

$$\Rightarrow \boxed{3 \frac{3}{4} \text{ days}}$$

② A can do  $\frac{1}{2}$  of a piece of work in 5 days, B can do  $\frac{3}{5}$  of the same work in 9 days and C can do  $\frac{2}{3}$  of that work in 8 days. In how many days can all of them together do the work?

$$\rightarrow A = \frac{1}{2} \text{ of work} = 5 \text{ days}$$

$$A = 5 \times \frac{2}{1}$$

$$A = 10 \text{ days}$$

$$B = \frac{3}{5} \text{ of work} = 9 \text{ days}$$

$$B = 9 \times \frac{5}{3}$$

$$B = 15 \text{ days}$$

$$C = \frac{2}{3} \text{ of work} = 8 \text{ days}$$

$$C = 8 \times \frac{3}{2} = 12 \text{ days}$$

$$(A) + (B) + (C)$$

$$\frac{1}{10} + \frac{1}{15} + \frac{1}{12} = ?$$

$$\frac{6+4+5}{60} \Rightarrow \frac{15}{60} \Rightarrow \frac{1}{4}$$

$$\therefore 4 \text{ days}$$

③ P can complete  $\frac{1}{4}$  of a work in 10 days, Q can complete  $40\%$  of the same work in 15 days, R completes  $\frac{1}{3}$  of the work in 13 days and S,  $\frac{1}{6}$  of the work in 7 days. Who will be able to complete the work first?

$$\rightarrow P = \frac{1}{4} \text{ work} = 10 \text{ days}$$

$$P = 10 \times 4 = 40 \text{ days}$$

$$R = \frac{1}{3} \text{ work} = 13 \text{ days}$$

$$R = 13 \times 3 = 39 \text{ days}$$

$$Q = \frac{40}{100} \Rightarrow \frac{2}{5} = 15 \text{ days}$$

$$S = \frac{1}{6} \text{ work} = 7$$

$$\text{work} = 42 \text{ days}$$

$$Q = 15 \times \frac{5}{2} \Rightarrow \frac{75}{2} \Rightarrow 37 \frac{1}{2} \text{ days}$$

$$\therefore \boxed{Q = 37 \frac{1}{2}}$$

④ A does  $\frac{4}{5}$  of a piece of work in 20 days; He then calls in B and they finish the remaining work in 3 days. How long B alone will take to do whole work?

→  $1$  (complete work)

$$\frac{4}{5} \text{ (A = 20 days)} \quad \frac{1}{5} \text{ (remaining)}$$

$$\frac{4}{5} \text{ work done by A} = 20 \text{ days}$$

$$A = 20 \times \frac{5}{4}$$

$$A = 25 \text{ days}$$

$$\frac{1}{5} (A+B) = 3 \text{ days}$$

$$A+B = 15 \text{ days}$$

$$A+B = \frac{1}{15}$$

$$\frac{1}{25} + B = \frac{1}{15}$$

$$B = \frac{1}{15} - \frac{1}{25}$$

$$B = \frac{5-3}{75} = \frac{2}{75} \Rightarrow \frac{75}{2}$$

$$B = 37 \frac{1}{2} \text{ days}$$

⑤ A does  $\frac{7}{10}$  part of work in 15 days. After that he completed the remaining work in 4 days with the help of B. in how many days will A and B together do the same work?

→  $1$  (complete work)

~~$\frac{7}{10} (A = 15 \text{ days})$~~ 

$$\frac{3}{10} \text{ (remaining)}$$

$$A+B = 4 \text{ days}$$

$$\frac{3}{10} (A+B) = 4$$

$$A+B = 4 \times \frac{10}{3}$$

$$A+B = 40 \frac{1}{3} \text{ days}$$

$$\therefore A+B = 13 \frac{1}{3} \text{ days}$$

⑥ A can cultivate  $\frac{2}{5}$  th of a land in 6 days and B can cultivate  $\frac{1}{3}$  rd of the same land in 10 days. working together A and B can cultivate  $\frac{4}{5}$  th of the land in,

→ ①

$$\frac{2}{5} \text{ of work} = 6 \text{ days}$$

$$A = 8 \times \frac{5}{2} = 15 \text{ days}$$

②

$$\frac{1}{3} \text{ of work} = 10 \text{ days}$$

$$B = 10 \times 3 = 30 \text{ days}$$

① + ② = ?

$$\frac{1}{15} + \frac{1}{30} \Rightarrow \frac{3}{30} \Rightarrow \frac{1}{10} \Rightarrow A+B = 10 \text{ days}$$

$$= 10 \times \frac{4}{5} = 8 \text{ days}$$

⑦ A can complete a work in 6 days while B can complete the same work in 12 days. If they work together and complete it, the portion of the work done by A is,

$$A = 6 \text{ days} = \frac{1}{6} \quad A+B = \frac{1}{6} + \frac{1}{12} = \frac{3}{12} = \frac{1}{4}$$

$$B = 12 \text{ days} = \frac{1}{12}$$

$$A+B = 4 \text{ days}$$

$$4 \times \frac{1}{8} \Rightarrow A = \frac{2}{3}$$

$$4 \times \frac{1}{12} \Rightarrow B = \frac{1}{3}$$

⑧ A completes  $\frac{2}{3}$  of his work in 10 days. Time he will take to complete  $\frac{3}{5}$  of the same work is,

$$A = \frac{2}{3} \text{ work} = 10 \text{ days}$$

$$A = 15 \times \frac{3}{2}$$

$$A = 15 \text{ days}$$

$$A = 15 \times \frac{3}{8}$$

$$A = 9 \text{ days}$$

## Work and Wages

Step ① one day work done

Step ② find ratio

Step ③ find share

① A can do a work in 3 days. B can do the same work in 2 days. Both of them finish the work together and get Rs 150. What is the share of A?

$$\rightarrow A = 3 \text{ days} = \frac{1}{3}$$

$$B = 2 \text{ days} = \frac{1}{2}$$

$$A:B = \frac{1}{3} : \frac{1}{2} = \frac{\frac{1}{3}}{\frac{1}{2}} \Rightarrow A:B = \boxed{2:3}$$

$$A = \frac{2}{5} \times 150 \Rightarrow \boxed{60}$$

② A and B undertook to do a piece of work for Rs 4500. A alone could do it in 8 days and B alone in 12 days. With the assistance of C they finished the work in 4 days. Then C's share of money is:

$$\rightarrow A = \frac{1}{8}, B = \frac{1}{12}, C = ?$$

$$A+B+C = \frac{1}{4}$$

$$\frac{1}{8} + \frac{1}{12} + C = \frac{1}{4}$$

$$C = \frac{1}{4} - \frac{1}{8} - \frac{1}{12}$$

$$= \frac{6-3-2}{24}$$

$$\boxed{C = \frac{1}{24}}$$

$$A:B:C = \frac{1}{8} : \frac{1}{12} : \frac{1}{24}$$

$$= \frac{3:2:1}{24}$$

$$\boxed{3:2:1}$$

(A) : (B) : (C)

$$\frac{1}{6} \times \frac{750}{4500}$$

$$\boxed{C = 750}$$

③ Three persons undertake to complete a piece of work for Rs 1200. The first person can complete the work in 8 days, second person in 12 days and third person in 16 days. They complete the work with the help of a fourth person in 3 days. What does the fourth person get?

$$\rightarrow A = \frac{1}{8}, B = \frac{1}{12}, C = \frac{1}{16}, D = ?$$

$$A + B + C + D = \frac{1}{3}$$

$$\frac{1}{8} + \frac{1}{12} + \frac{1}{16} + D = \frac{1}{3}$$

$$D = \frac{1}{3} - \frac{1}{8} - \frac{1}{12} - \frac{1}{16}$$

$$D = \frac{16 - 6 - 4 - 3}{48} = \frac{3}{48} \Rightarrow D = \frac{1}{16}$$

$$\textcircled{1} : \textcircled{2} : \textcircled{3} : \textcircled{4} \\ \frac{1}{8} : \frac{1}{12} : \frac{1}{16} : \frac{1}{16}$$

$$6 : 4 : 3 : 3$$

48

$$\boxed{6 : 4 : 3 : 3}$$

$$\frac{3}{48} \times 1200 = 75$$

$$\Rightarrow 75 \times 3 = 225$$

$$\boxed{D = 225}$$

④ A, B, C completed work costing Rs 1800. A worked for 6 days, B for 4 days and C for 9 days. If their daily wages are in the ratio of 5:6:4, how much amount will be received by A?

$$\rightarrow \text{Daily wages} \Rightarrow 5 : 6 : 4$$

$$\downarrow \quad \downarrow \quad \downarrow \\ 6 \times 5 \quad 4 \times 6 \quad 9 \times 4$$

$$\boxed{30 : 24 : 36}$$

$$A:B:C = \textcircled{5} 4:6$$

$$\frac{5}{15} \times \frac{120}{1800} = \textcircled{R} 600$$

⑤ A man and a boy received Rs 800 of wages for 5 days for the work they did together. The man's efficiency in the work was three times that of the boy. What are the daily wages of the boy?

$$\rightarrow M+B = 5 \text{ days} = 800$$

The man efficiency  
is thrice than the Boy  
(in term of days)

$$x : 3x \\ 5 : 15 \\ \text{days} \quad \text{days} \\ \times 3$$

$$\boxed{3 : \textcircled{1}} \\ m : B$$

$$\frac{1}{4} \times 800 = 200 \\ \frac{200}{5 \text{ days}} = 40 \text{ Rs}$$



⑧ A, B, C together earn ₹ 150 per day while A and C together earn ₹ 94 and B and C together earn ₹ 76. The daily earning of 'C' is

$$\rightarrow \begin{array}{l} A+B+C = 150 \\ A+C = 94 \\ B+C = 76 \\ \boxed{C = ?} \end{array} \quad \left| \begin{array}{l} C'share = (A+C) + (B+C) - A - B - C \\ = (A+C) + (B+C) - (A+B+C) \\ = 94 + 76 - 150 \\ \boxed{C'share = 20} \end{array} \right.$$

### Leaving

① A and B together can complete a work in 3 days. They started together but after 2 days B left the work. If the work is completed after 2 more days, B alone could do the work in how many days?

→ Normal method

$$A+B = \frac{1}{3}$$

$$A+B = 2 \times \frac{1}{3}$$

$$(A+B) = \frac{2}{3}$$

we take ① bcz for  
complete work

Remaining work = ① -  $\frac{2}{3} \Rightarrow \frac{1}{3}$  remaining

$$\frac{1}{3} \text{ work done by } A = 2 \text{ days}$$

$$1 \text{ work} = 2 \times 3 \text{ days}$$

$$\boxed{A = 6 \text{ days}}$$

$$A+B = \frac{1}{3}$$

$$\frac{1}{6} + B = \frac{1}{3}$$

$$B = \frac{1}{3} - \frac{1}{6} \Rightarrow \frac{1}{6} \quad (\therefore B = 6 \text{ days})$$

short cut

$$A+B = \frac{1}{3} \quad (\therefore A = \frac{1}{3} - B)$$

$$(A+B) \underset{\substack{\text{done} \\ \text{2 days}}}{2} + A \underset{\substack{\text{done} \\ \text{2 days}}}{(2)} = 1$$

$$2A + 2B + 2A = 1$$

$$4A + 2B = 1$$

$$4 \left[ \frac{1}{3} - B \right] + 2B = 1$$

$$\frac{4}{3} - 4B + 2B = 1$$

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

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

$$\frac{4-3}{3} = 2B$$

$$\frac{1}{3} = 2B$$

$$B = \frac{1}{6} \quad (\therefore B = 6 \text{ days})$$

② P and Q can finish a work in 30 days. They worked at it for 10 days and the Q left. The remaining work is done by P alone in 20 more days. How long will P take to finish the work alone?

→ Normal method

$$P+Q = \frac{1}{30}$$

$$P+Q = 10 \times \frac{1}{30} = \frac{1}{3}$$

$$P+Q = \frac{1}{3}$$

$$\text{Remaining work} = 1 - \frac{1}{3} = \frac{2}{3}$$

$$\frac{2}{3} \text{ work done by P alone} = 20 \text{ days}$$

$$1 \text{ work} = 20 \times \frac{3}{2}$$

$$P \text{ work} = 30 \text{ days}$$

Short cut

$$P+Q = \frac{1}{30} \Rightarrow Q = \frac{1}{30} - P$$

$$(P+Q)10 + P(20) = 1$$

$$10P + 10Q + 20P = 1$$

$$30P + 10Q = 1$$

$$30P + 10\left[\frac{1}{30} - P\right] = 1$$

$$30P + \frac{1}{3} - 10P = 1$$

$$20P = 1 - \frac{1}{3}$$

$$P = \frac{1}{30}$$

$$20P = \frac{2}{3}$$

$$P = \frac{2}{3} \times \frac{1}{20} = \frac{1}{30}$$

$$P = 30 \text{ days}$$

③ Ajay can do a piece of work in 25 days and Sanjay can finish it in 20 days. They work together for 5 days and then Ajay goes away. In how many days will Sanjay finish the remaining work.

→ Normal

$$A = \frac{1}{25}, S = \frac{1}{20}$$

$$A+S = \frac{1}{25} + \frac{1}{20}$$

$$A+S = \frac{9}{100}$$

$$(A+S) = \frac{9}{100} \times \frac{5}{20}$$

$$(A+S) = \frac{9}{20}$$

$$\text{Remaining work} = 1 - \frac{9}{20}$$

$$= \frac{11}{20} \quad \text{done by Sanjay}$$

$$\Rightarrow \frac{11}{20} \times \frac{20}{20} \leftarrow \begin{matrix} \text{Sanjay alone} \\ 20 \text{ days} \end{matrix}$$

$$\boxed{\text{Sanjay} = 11 \text{ days}}$$

Trick 1

$$(A+S)5 + S(x) = 1$$

$$\left(\frac{1}{25} + \frac{1}{20}\right)5 + \frac{1}{20}x = 1$$

$$\left(\frac{9}{100}\right)5 + \frac{1}{20}x = 1$$

$$\frac{1}{20}x = 1 - \frac{9}{20}$$

$$\frac{x}{20} = \frac{11}{20}$$

$$x = \frac{11}{20} \times 20$$

$$\boxed{x = 11 \text{ days}}$$

Trick 2

Ajay	Sanjay
5	$5+x$

$$\frac{5}{25} + \frac{5+x}{20} = 1$$

$$\frac{20+25+5x}{100} = 1$$

$$\frac{45+5x}{100} = 1$$

$$45+5x = 100$$

$$5x = 100 - 45$$

$$5x = 55$$

$$\boxed{x = 11 \text{ days}}$$

④ A and B can do a piece of work in 60 days and 75 days resp. Both begin together but after a certain time A leaves off. In such case, B finishes the remaining work in 30 days. After how many days did A leave?

→ Trick 1

$$A = \frac{1}{60}, B = \frac{1}{75}$$

$$(A+B)x + B(30) = 1$$

$$\left(\frac{1}{60} + \frac{1}{75}\right)x + \frac{1}{75} \times 30^2 = 1$$

$$\left(\frac{\frac{3}{100}}{200}\right)x = 1 - \frac{2}{5}$$

$$\left(\frac{3}{100}\right)x = \frac{3}{5}$$

$$x = \frac{3}{5} \times \frac{100}{3}$$

$$x = 20 \text{ days}$$

Trick 2

$$\begin{array}{cc} A & B \\ x & x+30 \end{array}$$

$$\frac{x}{60} + \frac{x+30}{75} = 1$$

$$\frac{5x+4x+120}{300} = 1$$

$$9x + 120 = 300$$

$$9x = 300 - 120$$

$$9x = 180$$

$$x = 20$$

Normal

$$A+B = \frac{1}{60} + \frac{1}{75}$$

$$= \frac{9}{300} \Rightarrow \frac{3}{100}$$

$$A+B = \frac{3}{100}$$

$$(A+B)x$$

$$B = \frac{1}{75} \times 30 =$$

$$B = \frac{2}{5} \text{ remaining work}$$

$$B = 1 - \frac{2}{5} \quad (1 \rightarrow \text{complete work})$$

$$= \frac{3}{5} \quad (\because A+B = \frac{3}{100})$$

$$\left[\frac{3}{5} \times \frac{100}{3} = 20 \text{ days}\right]$$

⑤ A can complete a piece of work in 40 days. He starts working, but having some other engagement leaves after 5 days. Thereafter B completes this work in 21 days. How many days would A and B take to complete this work working together?

→ Trick ①

$$A(5) + B(21) = 1$$

$$\frac{1}{40} \times 5 + B \times 21 = 1$$

$$21B = 1 - \frac{1}{8}$$

$$21B = \frac{7}{8}$$

$$B = \frac{7}{8} \times \frac{1}{21}$$

$$\boxed{B = \frac{1}{24}}$$

$$A + B = \frac{1}{40} + \frac{1}{24}$$

$$= \frac{8}{120} \Rightarrow \boxed{15 \text{ days}}$$

Trick ②

A	B
5	21

$$\frac{5}{40} + \frac{21}{x} = 1$$

$$\frac{21}{x} = 1 - \frac{1}{8}$$

$$\frac{21}{x} = \frac{7}{8}$$

$$x = 21 \times \frac{8}{7}$$

$$\boxed{x = 24}$$

$$B + A = \frac{1}{40} + \frac{1}{24}$$

$$= \frac{8}{120} \Rightarrow \boxed{15 \text{ days}}$$

Normal

$$A = \frac{1}{40} \times 5 \Rightarrow \frac{1}{8}$$

$$\text{Remaining} = 1 - \frac{1}{8} = \frac{7}{8}$$

$$\frac{7}{8} \text{ work done} = 21$$

$$B = 21 \times \frac{8}{7} \Rightarrow 24$$

$$\frac{1}{40} + \frac{1}{24}$$

$$\frac{8}{120} \Rightarrow \boxed{15 \text{ days}}$$

# Leaving (3 person)

① Ajay and Sunil together can complete a piece of work in 10 days. Sunil and Sanjay in 15 days and Sanjay and Ajay in 20 days. They worked together for 6 days, and then Ajay leaves. Sunil and Sanjay worked together for 4 more days, and Sunil leaves. How long will Sanjay take to complete the work?

→ Normal

$$\text{Ajay} + \text{Sunil} = \frac{1}{10}$$

$$\text{Sunil} + \text{Sanjay} = \frac{1}{15}$$

$$\text{Sanjay} + \text{Ajay} = \frac{1}{20}$$

$$2\text{Su} + 2\text{Aj} + 2\text{San} = \frac{1}{10} + \frac{1}{15} + \frac{1}{20}$$

$$\begin{aligned}\text{Su} + \text{Aj} + \text{San} &= \frac{1}{2} \left[ \frac{13}{60} \right] \\ &= \frac{13}{120} \quad \text{--- ①}\end{aligned}$$

$$\text{first 6 days} \Rightarrow \frac{13}{120} \times 6 \Rightarrow \frac{13}{20} \quad (\text{Ajay left})$$

$$\text{4 day work} \Rightarrow \frac{1}{15} \times 4 \Rightarrow \frac{4}{15} \quad (\text{Sunil left})$$

$$1 - \left( \frac{13}{20} + \frac{4}{15} \right)$$

$$= 1 - \frac{39+16}{60} \Rightarrow 1 - \frac{55}{60} \Rightarrow \frac{5}{60} = \frac{1}{12}$$

Trick

Aj+Su

Su+San

San+Aj

$$\frac{3}{10} + \frac{3+4}{15} + \frac{3}{20} + \text{San}(x) = 1$$

$$\begin{aligned}\text{San}(x) &= 1 - \left[ \frac{3}{10} + \frac{7}{15} + \frac{3}{20} \right] \\ &= 1 - \left[ \frac{18+28+9}{60} \right]\end{aligned}$$

$$\text{San}(x) = 1 - \frac{55}{60} \Rightarrow \frac{5}{60} \Rightarrow \frac{1}{12}$$

$$\frac{1}{12} \times x = \frac{1}{12} \Rightarrow x = \frac{1}{12} \times 120 \Rightarrow \underline{\underline{10 \text{ days}}}$$

$$\frac{1}{12} \Rightarrow \text{Sanjay}$$

$$\text{San} + \frac{1}{10} = \frac{13}{120}$$

$$\text{San} = \frac{13}{20} - \frac{1}{10}$$

$$\boxed{\text{San} = \frac{1}{120}}$$

$$\begin{cases} \text{Remaining} \\ \frac{1}{12} \end{cases}$$

$$\begin{aligned}\frac{1}{12} \text{ work} &= \frac{10}{120} \times \frac{1}{2} \\ &= \underline{\underline{10 \text{ days}}}\end{aligned}$$

② A, B, C can do piece of work in 16, 32 and 48 days, resp. They all begin together. A work continuously till it is finished, C leaves the work 2 days before its completion and B leaves the work 1 day before its completion. In what time is the work finished?

→ A      B      C

$$\frac{x}{16} + \frac{x-1}{32} + \frac{x-2}{48} = 1$$

$$\frac{x}{16} + \frac{x-1}{16 \times 2} + \frac{x-2}{16 \times 3} = 1$$

$$\frac{x}{1} + \frac{x-1}{2} + \frac{x-2}{3} = 16$$

$$\frac{6x+3x-3+2x-4}{6} = 16$$

$$11x - 7 = 96$$

$$11x = 96 + 7$$

$$x = \frac{103}{11} \text{ days}$$

$$x = 9\frac{4}{11} \text{ days}$$

③ A and B can finish a job in 10 days, while B and C can do it in 18 days. A started the job and worked for 5 days and left the job, then B worked for 10 days and remaining job is finished by C in 15 days. In how many days C alone have finished whole job?

→ A + B      B + C      C

$$\frac{5}{10} + \frac{5}{18} + \frac{10}{x} = 1$$

$$\frac{10}{x} = 1 - \left[ \frac{1}{2} + \frac{5}{18} \right]$$

$$\frac{10}{x} = 1 - \left[ \frac{\frac{9}{18} + \frac{5}{18}}{18} \right]$$

$$\frac{10}{x} = \frac{2}{3}$$

$$A \rightarrow 5 \text{ days}$$

$$B \rightarrow 10 \text{ days}$$

$$C \rightarrow 15 \text{ days}$$

$$\left( \because 1 - \frac{7}{9} = \frac{2}{9} \right)$$

$$x = \frac{15 \times 9}{2}$$

$$x = 45 \text{ days}$$

C alone

'x' person & 'y' person

Note 26 girls can do a piece of work in 91 days

$$26 \text{ girls} = 91 \text{ days}$$

$$1 \text{ day work} \Rightarrow 26 \text{ girls} = \frac{1}{91}$$

$$1 \text{ day work} \Rightarrow 1 \text{ girl} = \frac{1}{91 \times 26}$$

① 2 men and 3 boys can do a piece of work in 10 days while 3 men and 2 boys can do a piece of work in 8 days. In how many days can 2 men and 1 boy can do the work? 2m+1B=?

$$\rightarrow 2m + 3B = 10 \text{ days} \quad \textcircled{1}$$

$$2m + 2B = 8 \text{ days} \quad \textcircled{2}$$

$$2m + 3B = \frac{1}{10}$$

$$3m + 2B = \frac{1}{8}$$

$$\textcircled{1} \times 2 \Rightarrow 4m + 6B = \frac{1}{5}$$

$$\textcircled{2} \times 3 \Rightarrow 9m + 6B = \frac{3}{8}$$

$$-5m = \frac{1}{5} - \frac{3}{8}$$

$$-5m = \frac{8 - 15}{40}$$

$$-5m = -\frac{7}{40}$$

$$5m = \frac{7}{40}$$

$$\boxed{m = \frac{7}{40 \times 5}}$$

put in eqn ①

$$2 \left[ \frac{7}{40 \times 5} \right] + 3B = \frac{1}{10}$$

$$\frac{7}{100} + 3B = \frac{1}{10}$$

$$3B = \frac{1}{10} - \frac{7}{100}$$

$$3B = \frac{3}{100}$$

$$\boxed{1B = \frac{1}{100}}$$

$$\therefore 2m + 1B = ?$$

$$2 \left[ \frac{7}{40 \times 5} \right] + \frac{1}{100}$$

$$\frac{8}{100} \Rightarrow \frac{400}{800}$$

$$= \frac{25}{2}$$

$$\text{Ans} \boxed{2m + 1B = 12\frac{1}{2} \text{ days}}$$

Trick

$$2m + 3B = 10 \text{ days} \rightarrow \textcircled{1}$$

$$3m + 2B = 8 \text{ days} \rightarrow \textcircled{2}$$

$$\boxed{2m + 3B = \frac{1}{10}} \quad \boxed{3m + 2B = \frac{1}{8}}$$

$$2m + 3B = 24m + 16B$$

$$4m = 14B$$

$$\boxed{2m = 7B}$$

put in eqn ①

$$7B + 3B = 10 \text{ days}$$

$$\boxed{10 \text{ Boys} = 10 \text{ days}}$$

from que 2m + 1B = ?

put 2m = 7B

$$7B + 1B = ?$$

$$8 \text{ Boys} = ?$$

$$10 \text{ B} = 10 \text{ days}$$

$$10 \text{ Boys} \times 10 \text{ days} = 8 \text{ Boys} \times x \text{ days}$$

$$\frac{100}{8} = x$$

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

$$\boxed{x = 12\frac{1}{2} \text{ days}}$$

② If 6 men and 8 boys can do a piece of work in 10 days and 26 men and 48 boys can do the same in 2 days, then the time taken by 15 men and 20 boys to do the same type of work will be,  $15m + 20B = ?$

$$\rightarrow 6m + 8B = 10 \quad \text{--- (1)}$$

$$26m + 48B = 2 \quad \text{--- (2)}$$

$$6m + 8B = \frac{1}{10}$$

$$26m + 48B = \frac{1}{2}$$

$$\text{--- (1)} \times 6 \Rightarrow 36m + 48B = \frac{6}{10}$$

$$- 26m + 48B = \frac{1}{2}$$


---

$$10m = \frac{6}{10} - \frac{1}{2}$$

$$10m = \frac{6-5}{10}$$

$$1m = \frac{1}{10}$$

$$m = \frac{1}{100}$$

put  $m = \frac{1}{100}$  in eqn ①

$$6\left[\frac{1}{100}\right] + 8B = \frac{1}{10}$$

$$8B = \frac{1}{10} - \frac{6}{100}$$

$$\frac{8B}{2} = \frac{4}{100}$$

$$B = \frac{1}{200}$$

$$15m + 20B = ?$$

$$15\left[\frac{1}{100}\right] + 20\left[\frac{1}{200}\right] = ?$$

$$\frac{15}{100} + \frac{1}{10} = ?$$

$$\frac{15+10}{100} = ?$$

$$\frac{25}{100} = ?$$

$$? = 4 \text{ days}$$

Trick

$$6m + 8B = 10 \quad \text{--- (1)}$$

$$26m + 48B = 2 \quad \text{--- (2)}$$

$$6m + 8B = \frac{1}{10}$$

$$26m + 48B = \frac{1}{2}$$

$$60m + 80B = 52m + 96B$$

$$8m = \frac{16B}{2}$$

$$1m = 2B$$

put  $1m = 2B$  in eqn ①

$$12B + 8B = 10$$

$$20B = 10 \text{ days}$$

$$15m + 20B = ?$$

$$30B + 20B = ?$$

$$50B = ?$$

$$20 \text{ Boys} \times 10 \text{ days} = 50 \text{ Boys} \times ?$$

$$\frac{200}{4} = 50 \times ?$$

$$? = 4 \text{ days}$$

③ If 8 men or 12 boys can do a piece of work in 16 days  
the number of days required to complete the work by  
20 men and 6 Boys.

$$\rightarrow 8m = 16 \text{ days} \quad 12 \text{ Boys} = 16 \text{ days}$$

$$8m = \frac{1}{16}$$

$$1m = \frac{1}{16 \times 8}$$

$$12B = \frac{1}{16}$$

$$1B = \frac{1}{16 \times 12}$$

$$20m + 6B = ?$$

$$\frac{20}{5} \left[ \frac{1}{16 \times 8} \right] + 6 \left[ \frac{1}{16 \times 12} \right] = ?$$

$$\frac{5}{32} + \frac{1}{32} = ?$$

$$? = \frac{6}{32}$$

$$? = \frac{32}{6}$$

$$? = 5 \frac{1}{3} \text{ days}$$

Trick

$$8m = 16 \text{ days}, 12 \text{ Boys} = 16 \text{ days}$$

$$20m + 6B = ?$$

$$8m = 12 \text{ Boys}$$

$$2m = 3B$$

$$30B + 6B = ?$$

$$36B = ?$$

$$12 \text{ Boys} \times 16 \text{ days} = 36 \text{ Boys} \times ?$$

$$? = \frac{16}{3}$$

$$? = 5 \frac{1}{3} \text{ days}$$

④ If 10 men or 20 women or 40 children can do a piece of work in 7 months, then 5 men and 5 women and 5 children together can do it in ?

$$\rightarrow 10m = 7, 20w = 7, 40c = 7$$

$$10m = \frac{1}{7}, 20w = \frac{1}{7}, 40c = \frac{1}{7}$$

$$m = \frac{1}{7 \times 10}$$

$$w = \frac{1}{140}$$

$$c = \frac{1}{280}$$

$$5m + 5w + 5c = ?$$

$$5 \left[ \frac{1}{70} \right] + 5 \left[ \frac{1}{140} \right] + 5 \left[ \frac{1}{280} \right] = ?$$

$$\frac{20 + 10 + 5}{280} = ?$$

$$? = \frac{280}{35}$$

$$? = 8 \text{ months}$$

$$10m = 7, 20w = 7, 40c = 7$$

$$10m = 20w = 40c$$

$$1m = 2w = 4c$$

$$5m + 5w + 5c = ?$$

$$20c + 10c + 5c = ?$$

$$35c = ?$$

$$\frac{8}{40} \times 7 = \frac{35}{5} \times 2$$

$$? = 8 \text{ months}$$

## Arithmetic Progressions

$$\text{eg } 1+4+7+\dots+58$$

on finding the sum of (AP)

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

$n$  = Number of terms  $(4) - (1) = 3$

$d$  = Common difference (second no. - first no.)

$a$  = First number

$$\begin{aligned} S_n &= \frac{n}{2} [2a + (n-1)d] \\ &= \frac{20}{2} [2(1) + (19)(3)] \\ &= 10 [59] = 590 \end{aligned}$$

1  
4  
7  
10  
13  
16  
19  
22  
25  
28  
31  
34  
37  
40  
43  
46  
49  
52  
55  
58

58  
20  
Numbers

① One man started a project on the first day. One man joining on each day starting from the second day. The project will be completed in exactly 20 days. Instead, if a team of 7 men work regularly, the work will be completed exactly in  $n$  days? What is  $n$ ?

$$\rightarrow 1, 2, 3, 4, \dots, 20$$

$$1+2+3+4+\dots+20$$

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

$$= \frac{20}{2} [2(1) + 19(1)]$$

$$\text{Total work} = 10 [21] = 210$$

$$= \frac{210}{7}$$

$$= 30 \text{ days}$$

② A person can complete a job in 120 days. He works alone on Day 1. On Day 2, he is joined by another person. On Day 3, they are joined by another person like this, everyday a new person with the same efficiency joins the work. How many days are required to complete the job?

$$\rightarrow 1, 2, 3, \dots$$

$$1+2+3+\dots+N = 120$$

$$\frac{N}{2} [2a + (n-1)d] = 120$$

$$\frac{N}{2} [2 + (n-1)1] = 120$$

$$\frac{N}{2} [2 + (n-1)] = 120$$

$$\frac{N}{2} [2 + (n-1)] = 120$$

$$\frac{N}{2} (n+1) = 120$$

$$N(n+1) = 240$$

$$\text{assume } N=15$$

$$15(15+1) = 240$$

assume value  
is the ans  
(15 days)

$$\begin{array}{r} \downarrow \\ \times 16 \\ \hline 240 \end{array}$$

**Advance level**

① At their usual efficiency levels, A and B together finish a task in 12 days. If A had worked half as efficiently as she usually does, and B had worked three times as efficiently as he usually does, the task would have been completed in 9 days. How many days would A take to finish the task if she works alone at her usual efficiency?

$$\begin{cases} A = x \\ B = y \end{cases}$$

$$x + y = \frac{1}{12}, \quad \frac{x}{2} + 3y = \frac{1}{9}$$

$$9\left(\frac{x}{2} + 3y\right) = 1$$

usual efficiency

$$\begin{array}{l|l} 12(x+y) = 1 & 4.5x + 27y = 1 \\ 12x + 12y = 4.5x + 27y & \uparrow \\ 7.5x = 15y & \text{different efficiency} \end{array}$$

$$x = 2y$$

$$y = \frac{x}{3}$$

$$\begin{array}{l} 12(x+y) = 1 \\ 12x + 12\left(\frac{x}{2}\right) = 1 \end{array}$$

$$\begin{array}{l} 18x = 1 \\ x = \frac{1}{18} \end{array}$$

ans: 18 days

② Ramesh and Ganesh can together complete a work in 16 days. After seven days of working together, Ramesh got sick and his efficiency fell by 30%. As a result, they completed the work in 17 days instead of 16 days. If Ganesh had worked alone after Ramesh got sick, in how many days would he have completed the remaining work?

$$\begin{cases} R = x \\ G = y \end{cases}$$

$$① (x+y) = \frac{1}{16}$$

fell by 30% = 70% = 0.7 efficiency

$$② 7(x+y) + 0.7(10x) + 10y = 1$$

only ganesh work

17 days

7 both work  
(x+y)

10 remaining  
(Ramesh sick  
efficiency 0.7)

0.7(10x)

$$7x + 7y + 7x + 10y = 1$$

$$14x + 17y = 1$$

$$16x + 16y = 14x + 17y$$

$$2x = y$$

$$x = \frac{y}{2}$$

$$7x + 7y + y(a) = 1$$

$$7\left(\frac{1}{48}\right) + 7\left(\frac{1}{24}\right) + \frac{1}{24}(a) = 1$$

$$\frac{7 + 14 + 2a}{48} = 1$$

a = 13.5 days

put x value in eqn ①

$$\frac{14}{8}\left(\frac{y}{2}\right) + 16y = 1$$

$$y = \frac{1}{24}$$

put y value in  
 $2x = y$

$$2x = \frac{1}{24}$$

$$x = \frac{1}{48}$$

## Joining

③ Anil alone can do a job in 20 days while Sunil alone can do it in 40 days. Anil starts the job, and after 3 days, Sunil joins him. Again, after a few more days, Bimal joins them and they together finish the job. If Bimal has done 10% of the job, then in how many days was the job done?

$$\rightarrow \boxed{\begin{array}{l} A = 20 \text{ days} \\ S = 40 \text{ days} \\ (x-3) \end{array}}$$

$$\underbrace{\frac{x}{20} + \frac{x-3}{40}}_{(90\% \text{ job})} + \underbrace{\frac{10\%}{\text{Job}}}_{\text{Bimal}} = 1$$

Joining  $\Rightarrow 'x'$   $\rightarrow$  Total days  
Job completed

$$\left| \begin{array}{l} \frac{x}{20} + \frac{x-3}{40} = \frac{90}{100} \\ \frac{2x+x-3}{40} = \frac{90}{100} \\ 3x = 36 + 3 \\ x = \frac{39}{3} \\ \therefore x = 13 \text{ days} \end{array} \right.$$

# Wages

## YT: Career Ride

Time & Work  
 Invert  
 $N \rightarrow \frac{1}{N}$

### TIPS

- 1) ↑ work ↑ money
  - 2) A - 2 Days → fast ↑ money
  - B - 3 Days → slow ↓ money
- ↓ days ↑ money
- Income of  $\frac{1}{\text{Days}}$

\* Ratio Days A:B =  $2:3$

\* Ratio Income A:B =  $3:2$

3) Share of B =  $\frac{2}{3+2} \times (\text{Total Income})$   
 Income =  $\frac{2}{5} (\text{Total Income})$

Share of A =  $\frac{3}{3+2} \times (\text{Total Income})$   
 Income =  $\frac{3}{5} (\text{Total Income})$

4) ↑ work ↑ money  
 A - 2D  $\rightarrow \frac{1}{2}$  ← one day work  
 B - 3D  $\rightarrow \frac{1}{3}$  ← one day work

Ratio A:B =  $\frac{1}{2} : \frac{1}{3} = [3:2]$

Ratio Income A:B =  $[3:2]$

more work, more money  
 less work, less money.

### 5) Invert

one day work

$N \rightarrow \frac{1}{N}$  ⊗  $\frac{1}{N} \rightarrow N$  day

A does  $\frac{1}{8}$  work in ① day

-: Total Work done in 8 days

① Ramesh can do a work in 5 days. Suresh can do the same work in 7 days. The total amount given for this work to them is Rs 480. If both are working together, then what will be the share of Suresh?

→ ↑ work ↑ money (more work, more money)

R  $\rightarrow$  5 Days ↑ fast ↑ money

S  $\rightarrow$  7 Days

Ratio Days = 5:7

Income Ratio (R:S) = 7:5

Share of Suresh =  $\frac{5}{7+5} \times \text{Total Income}$

$$= \frac{5}{12} (480) = \boxed{\text{Rs } 200}$$

Ramesh Share

$$\Rightarrow 480 - 200$$

$$\Rightarrow \boxed{280}$$

② Ramegh can do a work in 15 days. Vijay and Ramegh together do the same work in 10 days. They received Rs 1155 for that work. What is share of Ramegh and Vijay?

$$\rightarrow R \rightarrow 15 \text{ days} \rightarrow \frac{1}{15} \text{ day}$$

$$V \rightarrow 'V' \text{ days} \rightarrow \frac{1}{V} \text{ day}$$

$$V+R \rightarrow 10 \text{ days} \rightarrow \frac{1}{10} \text{ day}$$

$$V+R = \frac{1}{V} + \frac{1}{15} = \frac{1}{10}$$

$$Vijay = \frac{1}{V} = \frac{1}{10} - \frac{1}{15} = \frac{3-2}{30} = \frac{1}{30}$$

Vijay does  
1 day  
work  
complete  
entire work  $\Rightarrow 30 \text{ days}$

Ramegh > Vijay

Ratio days R:V = 15 : 30

Income Ratio R:V = 30:15

Ratio of work 1 day R:V =  $\frac{1}{15} : \frac{1}{30}$

$$R:V = 2:1$$

$$\text{Income } R:V = 2:1$$

$\uparrow$  work  $\uparrow$  money

$$\text{Ramegh Share} = \frac{2}{2+1} \times 1155$$

$$= \frac{2}{3} \times 1155 = \boxed{\text{Rs } 770}$$

$$\text{Vijay Share} = 1155 - 770 = \boxed{\text{Rs } 385}$$

③ P, Q, R take a job for Rs 640. P & Q together finish  $\frac{2}{5}$  th of the work and rest is done by R alone. What is the share of R?

$$\rightarrow \begin{array}{c} P, Q, R \\ \downarrow \quad \downarrow \quad \downarrow \\ \frac{2}{5} \quad 1 - \frac{2}{5} = \frac{3}{5} \end{array} \quad \text{R alone}$$

$$\begin{array}{l} \uparrow \text{work} \quad \uparrow \text{money} \\ \frac{3}{5} \quad \frac{3}{5} \text{ th money} \\ R's \text{ share} = \frac{3}{5} \times 640 = \boxed{\text{Rs } 384} \end{array}$$

④ P can do a job in 30 days, while Q alone do it in 45 days. They work together for 15 days and rest of the job is done by R in 6 days. They get Rs 15000 for the whole job. What will be R's share?

1 day

$$\rightarrow P \rightarrow 30 \text{ day} \rightarrow \frac{1}{30}$$

$$Q \rightarrow 45 \text{ day} \rightarrow \frac{1}{45}$$

$$P+Q \rightarrow \frac{1}{30} + \frac{1}{45} \rightarrow \frac{3+2}{90} = \frac{1}{18}$$

$$P+Q(15 \text{ days}) = \frac{1}{18} \times 15$$

$$\text{work} = \frac{15}{18} = \frac{5}{6}$$

$$\begin{aligned} \text{R alone} &= \text{Remaining} \\ &= 1 - \frac{5}{6} = \frac{1}{6} \end{aligned}$$

$$R = \frac{1}{6} \times 15000$$

$$= \boxed{\text{Rs } 2500}$$

⑤ A man and a boy received Rs 1800 as wages for 3 days for a job they did together. The man's efficiency in the work was 5 times that of the boy. What is the daily wages of the boy?

$$\rightarrow M+B = \underline{\text{Rs } 1800} = 3 \text{ days}$$

$$M+B(1 \text{ day}) = \frac{1800}{3} = \underline{\text{Rs } 600} \quad (\text{Total daily wage})$$

$$M \rightarrow 5B$$

$$M \rightarrow 5 \text{ times } B$$

↑ work ↑ money

$$\text{Income } M:B = 5:1$$

$$B = \frac{1}{5+1} (\text{Total daily wages})$$

$$= \frac{1}{6} \times 600$$

$$= \boxed{\text{Rs } 100}$$

⑥ Parothiv was appointed for 100 day job. The condition was that he will be paid Rs 24 for every working day. But he will also be fined Rs 12 for every day he is absent. At the end, he got Rs 420. For how many days, he was absent?

*absent as cut*

$k \rightarrow \text{absent}$

$(100-k) \rightarrow \text{present}$

$$\rightarrow (100 - k) 24 - 12k R\$ = 420$$

$$2400 - 24k - 12k = 420$$

$$k = 55 \text{ days}$$

⑦ Total wages of 6 men, 4 women and 8 boys is Rs 26. If the wages of 6 men is equal to that of 8 women and the wages of 4 women is equal to that of 6 boys then find out the total wages of 8 men, 6 women and 4 Boys.

$$\rightarrow 1 \text{ man} = M R\$ ; 1 \text{ woman} = W R\$ ; 1 \text{ Boy} = B R\$$$

$$6M = 8W ; 4W = 6B$$

$$M = \frac{8W}{6} ; B = \frac{4W}{6}$$

$$6M + 4W + 8B = 26$$

$$8W + 4W + 8\left(\frac{4W}{6}\right) = 26$$

$$24W + 12W + 16W = 26 \times 3$$

$$W = R\$ 1.5$$

$$1 \text{ man} = M = \frac{8}{6} \times 1.5$$

$$M = R\$ 2$$

$$1B = \frac{4}{6} \times 1.5$$

$$= R\$ 1$$

$$8M + 6W + 4B$$

$$= 16 + 9 + 4$$

$$= R\$ 29$$