

## Time & Work.

13-09-19

1. If A can do piece of work in 'n' days, then A's 1 day's work =  $\frac{1}{n}$ .

2. If A's 1 day's work =  $\frac{1}{n}$ , then A can finish the work in 'n' days.

3. If A is thrice as good a workman as B, then :

Ratio of work done by A & B = 3:1.

The ratio of time taken by A & B to finish A work = 1:3.

Q. If Roger can do a piece of work in 8 days & Antony can complete the same work in 5 days, In how many days will both of them together complete it.

$$R = \frac{1}{8}$$

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

$$= \frac{5+8}{40} = \frac{13}{40} = 3.07.$$

Q. A & B together can complete a piece of work in 15 days & B alone in 20 days. In how many days can 'A' alone complete the work.

$$A+B = \frac{1}{15} \quad \therefore A + \frac{1}{20} = \frac{1}{15}$$

$$A = \frac{1}{15} - \frac{1}{20} = \frac{20-15}{300}$$

$$\therefore A = \frac{1}{60}$$

$$= \underline{60 \text{ days.}}$$

Q. A alone can complete a piece of work of Rs 300 in 6 days, but by engaging an assistant the work is completed in 4 days. Find the share to be received by the assistant.

$$A \rightarrow 6$$

$$A+B \rightarrow 4 \quad \therefore B \rightarrow 2$$

$$A = \frac{6}{300} = 50$$

$$\therefore \text{Assistant} = 2 \times 50 = \underline{100 \text{ Rupees}}$$

Q. 'A' can do a work in 4 days, B in 5 days & C in 10 days. Find the time taken by A, B & C to do the work together.

$$A \rightarrow 4$$

$$B \rightarrow 5$$

$$C \rightarrow 10$$

$$\frac{1}{4} + \frac{1}{5} + \frac{1}{10}$$

$$= \frac{5+4+2}{20} = \underline{\underline{\frac{11}{20}}}$$

14-09-19

Q. 9 children can complete a piece of work in 360 days. 18 Men can complete the same piece of work in 72 days & 12 Women can complete it in 162 days. In how many days can 4 Men, 12 women & 10 children together complete the piece of work.

$$\frac{1}{9 \times 360} + \frac{1}{18 \times 72} + \frac{1}{12 \times 162}$$

$$\frac{1}{3240} + \frac{1}{1296} + \frac{1}{1944}$$

$$10 \times \frac{1}{3240} + 4 \times \frac{1}{324} + 12 \times \frac{1}{162}$$

$$\frac{1}{324} + \frac{1}{324} + \frac{1}{162}$$

$$\frac{1+1+2}{324} = \frac{4}{324} = \frac{1}{81}$$

∴ 81 days

Q.

15-09-19

Q. A can do the work in 4 days, B in 5 days & C in 10 days. Find the time taken by A, B & C to do the work together.

$$A = \frac{1}{4}, B = \frac{1}{5}, C = \frac{1}{10}$$

$$\frac{1}{4} + \frac{1}{5} + \frac{1}{10}$$

$$= \frac{5+4+2}{20} = \frac{11}{20}$$

Q. A can do a piece of work in 10 days, B can do the same work in 20 days. With the help of C they finish the work in 4 days. C can do the work in how many days, working alone.

$$\frac{1}{10} + \frac{1}{20} + \frac{1}{C} = \frac{1}{4}$$

$$\frac{1}{C} = \frac{1}{4} - \frac{1}{10} - \frac{1}{20}$$

$$= \frac{5-2-1}{20} = \frac{2}{20}$$

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

$$\therefore C = 10 \text{ days}$$

Q. A can do a piece of work in 12 days, B can do this work in 16 days. A started the work alone. After how many days should B join so that work is finish in 9 days.

B will join the work after 'x' days.

$$\therefore A = \frac{1}{12}, B = \frac{1}{16}$$

$$\frac{9}{12} + \frac{(9-x)}{16} = 1$$

$$36 + 3(9-x) = 48$$

$$36 + 27 - 3x = 48$$

$$3x = 36 + 27 - 48$$

$$3x = 15$$

$$\therefore \underline{\underline{x = 5}}$$

Q. A & B can do a piece of work in 4 days, while C & D can do the same work in 12 days. In how many days will A, B, C & D do it together.

$$\frac{1}{A} + \frac{1}{B} = 4; \frac{1}{C} + \frac{1}{D} = 12$$

$$\frac{1}{4} + \frac{1}{12} = \frac{3+1}{12} = \frac{4}{12} = \frac{1}{3}$$

3 days

Q. A & B can do a piece of work in 40 days. B & C can do it in 120 days. If B alone can do it in 120 days, in how many days will A & C do it together.

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

$$\frac{1}{B} + \frac{1}{C} = \frac{1}{120}$$

$$\frac{1}{A} + 2\left(\frac{1}{B}\right) + \frac{1}{C} = \frac{1}{40} + \frac{1}{120}$$

$$= \frac{3+1}{120} = \frac{4}{120} = \frac{1}{30}$$

$$\frac{1}{A} + 2\left(\frac{1}{90}\right) + \frac{1}{C} = \frac{1}{30}$$

$$\frac{1}{A} + \frac{1}{90} + \frac{1}{C} = \frac{1}{30}$$

$$\frac{1}{A} + \frac{1}{C} = \frac{1}{30} - \frac{1}{90}$$

$$\frac{1}{A} + \frac{1}{C} = \frac{3-1}{90} = \frac{2}{90} = \frac{1}{45}$$

A + C = 45 days

P. A, B & C & D can do a piece of work in 20 days. If A & B can do it 50 days & C alone in 60 days, find the time in which D alone.

$$\frac{1}{50} + \frac{1}{60} + \frac{1}{D} = \frac{1}{20}$$

$$\frac{1}{D} = \frac{1}{20} - \frac{1}{50} - \frac{1}{60}$$

$$= \frac{15 - 6 - 5}{300} = \frac{4}{300}$$

$$\therefore D = \underline{\underline{75 \text{ days}}}$$

Q. A, B & C can do a piece of work in 8 days, B & C together do it in 24 days, B alone can do it in 40 days in what time will it be done by C in working alone

$$\frac{1}{A} + \frac{1}{B} + \frac{1}{C} = \frac{1}{8}, \quad \frac{1}{B} + \frac{1}{C} = \frac{1}{24}$$

$$\therefore \frac{1}{40} + \frac{1}{C} = \frac{1}{24} \Rightarrow \frac{1}{C} = \frac{1}{24} - \frac{1}{40}$$

$$= \frac{5 - 3}{120} = \frac{2}{120} = \frac{1}{60}$$

$$\therefore C = \underline{\underline{60 \text{ days}}}$$

Q. 2 Men & 3 boys can do a piece of work in 10 days while 3 Men & 2 boys can do the same work in 8 days. In how many days can 2 Men & 1 boy do the work?

$$(2M + 3B)10 = (3M + 2B)8$$

$$20M + 30B = 24M + 16B$$

$$14B = 4M$$

$$\underline{\underline{7B = 2M}}$$

$$(2M + 3B)10 = (2M + B)x$$

$$(7B + 3B)10 = (7B + B)x$$

$$(10B)10 = (8B)x$$

$$100 = 8x$$

$$\therefore x = \frac{100}{8} = \underline{\underline{12.5 \text{ days}}}$$

Q. 3 Men & 4 Women can earn Rs 3780 in 7 days. 11 Men & 13 Women can earn Rs 1540 in <sup>8 days</sup>. In what time will 7 Men & 9 Women earn Rs 12400.

$$3x + 4y = \frac{3780}{7} = 540 \quad \text{--- (1)}$$

$$11x + 13y = \frac{15040}{8} = 1880 \quad \text{--- (2)}$$

$$\textcircled{1} 3x + 4y = 5940$$

$$33x + 44y = 5940$$

$$\underline{33x + 39y = 5640}$$

$$5y = 300$$

$$\therefore \underline{y = 60}$$

$$3x + 4y = 540$$

$$3x + 240 = 540$$

$$\therefore 3x = 300 \Rightarrow \underline{x = 100}$$

$$7x + 9y = 7 \times 100 + 9 \times 60$$

$$= 700 + 540 = \underline{1240}$$

$$7 \text{ Men } \& 9 \text{ Women} = \frac{12400}{1240}$$

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