WORK : It is the effort applied to accomplish a task.

Worker ⟶

Work from Days:

If X can do a piece of work in m days, then X's 1 day's work = 1/m of the work

If Y can do a piece of work in n days, then Y's 1 day's work = 1/n of the work

If X and Y work together then their combined work is= $1/m$ + $1/n$ of the work

$$= \left(\frac{1}{m} + \frac{1}{n}\right)$$

LCM method of Calculating work & time

\#

Total work ⇒ LCM

$$A \longrightarrow 10$$
$$B \longrightarrow 30$$

$\longrightarrow$ 30 unit

Efficiency

$$\longrightarrow \frac{30}{10} = 3 \text{ unit/day}$$

$$\longrightarrow \frac{30}{30} = \frac{1}{+} \text{ unit/day}$$
$$\underline{\quad 4 \quad}$$

$$time = \frac{Work}{Efficiency}$$

$$= \frac{30}{4} = 7.5 \text{ day}$$
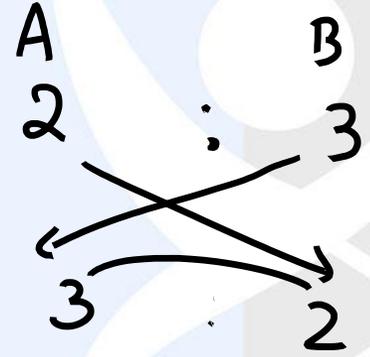
Relationship between work , time and efficiency

$$time = \frac{Work}{Efficiency}$$

$$Time \propto \frac{1}{Efficiency}$$

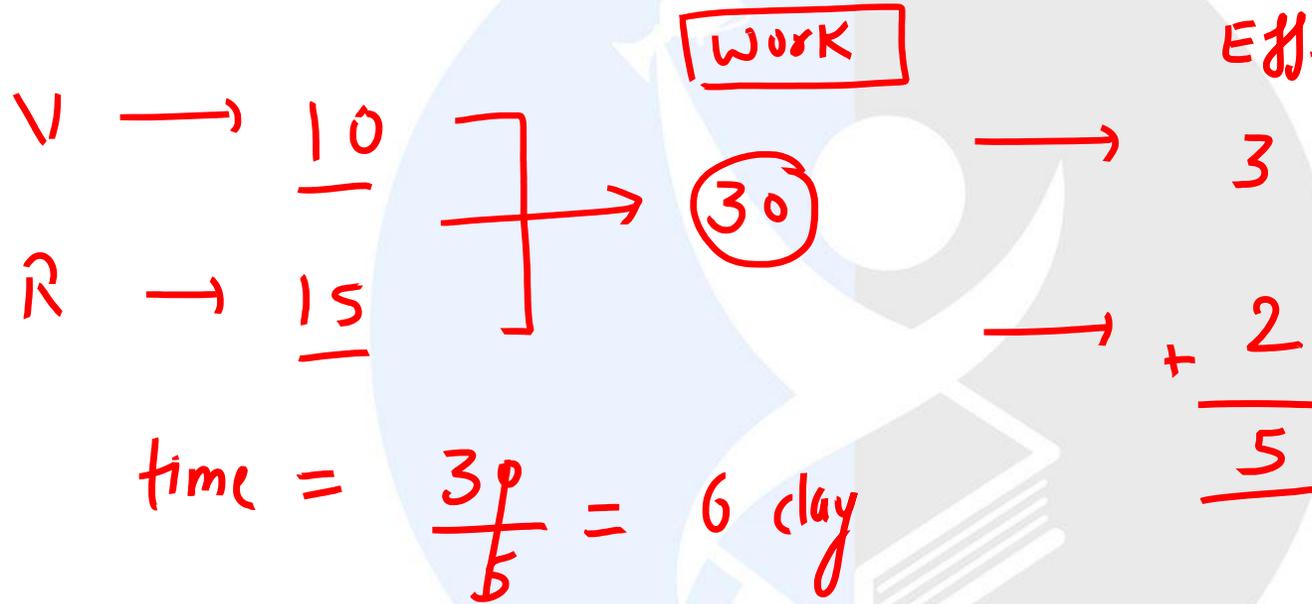|	A		B
Time	2	:	3
Eff.	3	:	2

If Varun and Raghav can do a job in 10 days and 15 days independently, how many days would they take to complete the same job working simultaneously?
(1) 6 days (2) 9 days (3) 10 days (4) 12 days

Work

Eff.

$V \longrightarrow 10$

$R \longrightarrow 15$

$\longrightarrow 30$

$\longrightarrow 3$

$\longrightarrow +\dfrac{2}{5}$

$time = \dfrac{30}{5} = 6\ day$

A and B could do a piece of work in 12 days and 20 days respectively. Find the number of days taken by them to complete 2/3rd of the work together. (in days)

(a)10

(b)2

(c)5

(d)8

work

$A \longrightarrow 12$
$B \longrightarrow 20$ $\Big\}$ $\longrightarrow$ $\boxed{60}$ unit $\longrightarrow 5$

$\longrightarrow +\dfrac{3}{8}$

$\text{time} = \dfrac{40}{8} = 5 \text{ days}$

$\dfrac{20}{60 \times \dfrac{2}{3}} = 40 \text{ unit}$

E

$\begin{array}{c|cc} 2 & 12 & 20 \\ \hline 2 & 6 & 10 \\ & 3 & 5 \end{array}$

A work is completed by P and Q together in 30 days. When a third person R joined them, then the work is completed in 18 days. In how many days, the work is completed by R alone? (in days)
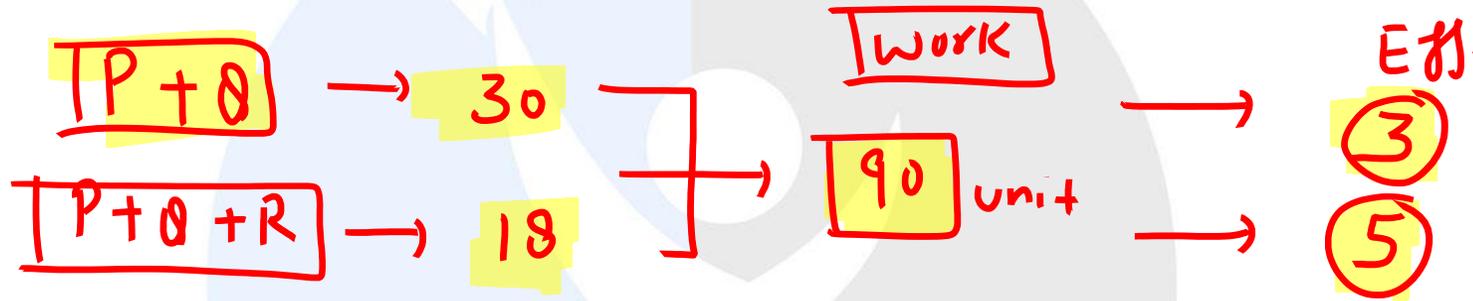
(a) 25
(b) 20
(c) 45
(d) 30

$P + Q \rightarrow 30$

$P + Q + R \rightarrow 18$

Work $\rightarrow$ 90 unit

Eff.

$P + Q + R = 5$

$3 + R = 5$

$R = 2$

$\bigcirc \begin{array}{c|c} 30, 18 \\ \hline \textcircled{5}\,\textcircled{3} \end{array}$

$t_R = \dfrac{Work}{Eff \ of \ R} = \dfrac{90}{2} = 45 \ days$

A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?
(a) 12days (b) 15days (c)16days (d)18 days

Ans

$A \rightarrow 20$

$B \rightarrow 30$ → 60 unit

$C \rightarrow 60$

1	2	3	4	5	6
A	A	A+B+C	A	A	A+B+C
③	③	(3+2+1)	3	3	6
		⑥			

12 unit

→ 3

→ 2

→ 1

12 unit

$12 \text{ unit} \rightarrow \dfrac{3}{12} \times 60$ 15

$60 \text{ unit} \qquad 1 \qquad 4$
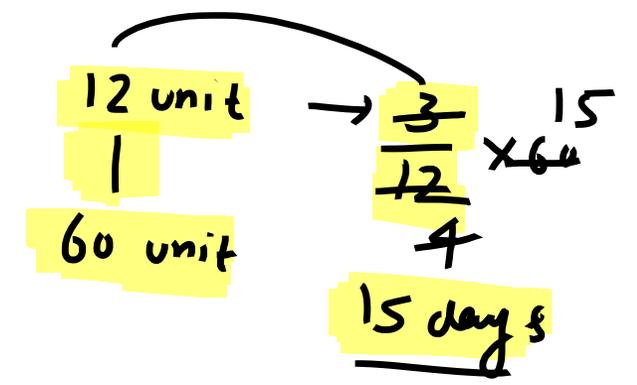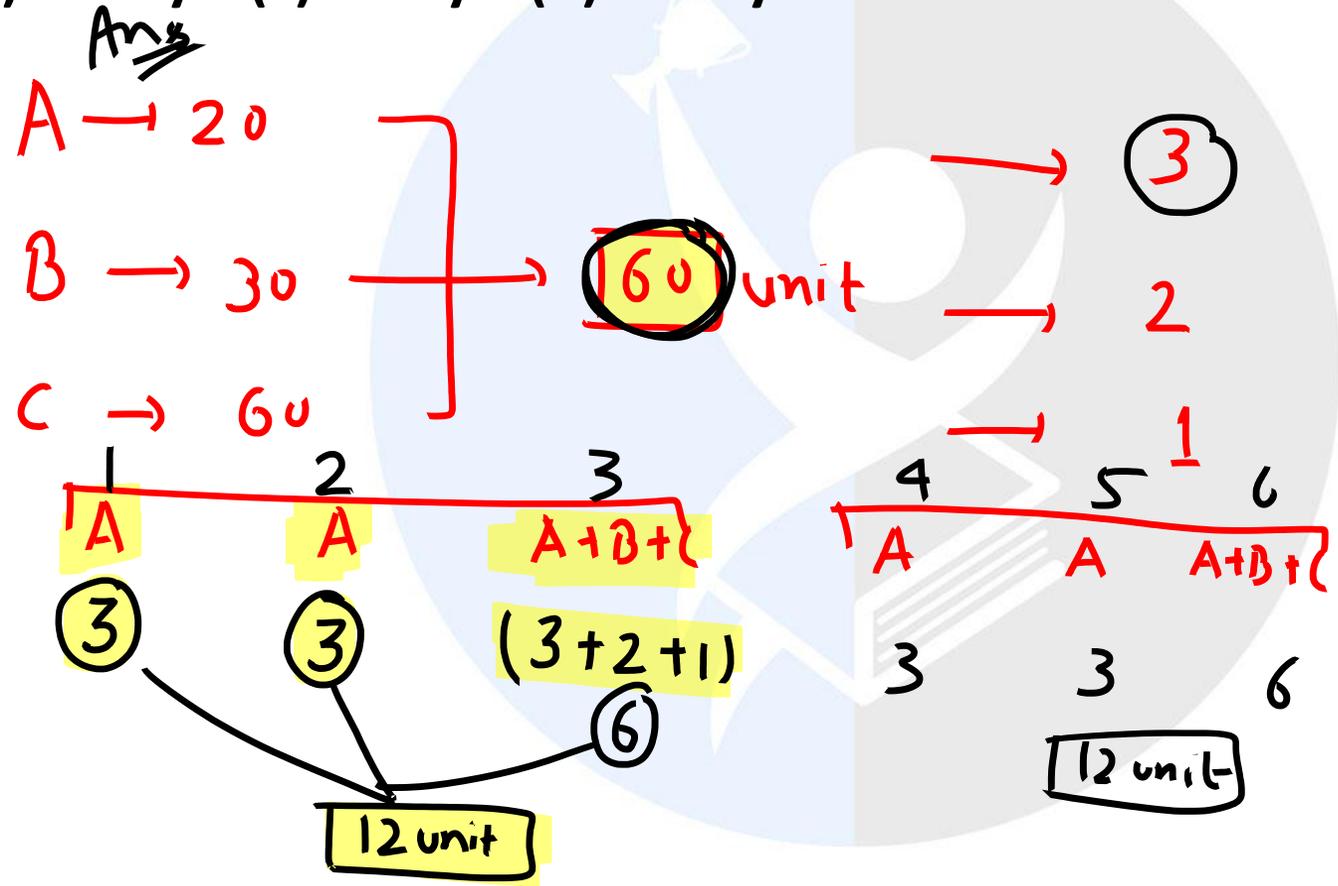
15 days

A and B can do a piece of work in 15 days. B and C can do the same work in 10 days and A and C can do the same work in 12 days. Time taken by A, B and C together to do the job is?

(a) 4 days (b) 9 days (c) 8 days (d) 5 days

$$A+B \rightarrow 15$$

$$B+C \rightarrow 10$$

$$A+C \rightarrow 12$$

$$60$$

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

$$\frac{6}{5}$$

$$A+B+B+C+A+C = 4+6+5$$

$$2A+2B+2C = 15$$

$$[A+B+C] = \frac{15}{2}$$

$$t_{(A+B+C)} = \frac{\overset{4}{\cancel{60}} \times 2}{\cancel{15}}$$

$$8 \ day$$

(c)

A can complete a piece of work in 10 days, B in 15 days and C in 20 days. A and C worked together for two days and then A was replaced by B. In how many days, altogether, the work was completed?

(a) 12 days (b) 10 days (c) 6 days (d) 8 days

$A \longrightarrow 10$

$B \longrightarrow 15$ $\longrightarrow$ 60

$C \longrightarrow 20$

$\longrightarrow$ ⑥

$\longrightarrow$ ④

$\longrightarrow$ ③

Ans

$(A+C) \times 2 + (B+C) x = 60$

$18 + 7x = 60$

$x = 6$

Work done by A&C + Work (B+C) = Total work ⑥

$(A+C) \times ② + (4+3) \cdot x = 60$

$(6+3) \times 2 + 7x = 60$

$18 + 7x = 60$

$7x = 42$

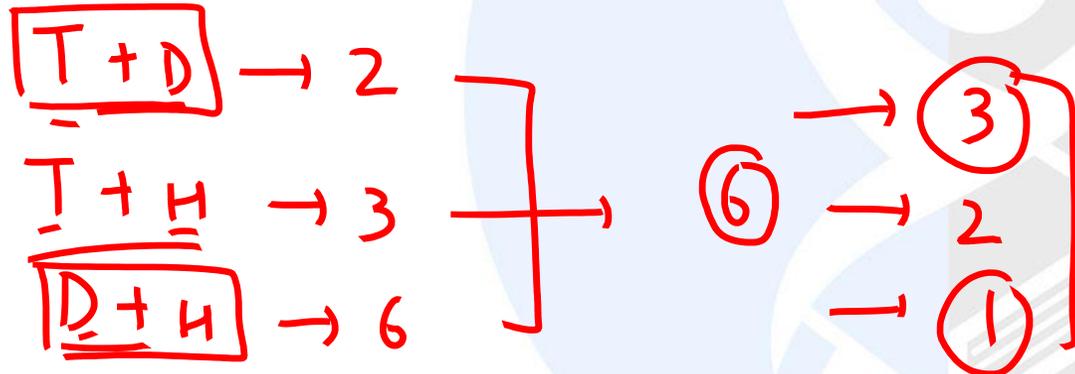$x = 6$ days

$+ 2$

Total time $\underline{8\ day}$

PYQ

It takes 2 hours for Tiwari and Deo to do a job. Tiwari and Hari take 3 hours to do the same job. Deo and Hari take 6 hours to do the same job. Which of the following statements is incorrect?

(1) Tiwari alone can do the job in 3 hours ✗

(2) Deo alone can do the job in 6 hours ✗

(3) Hari does not work at all ✓

(4) Hari is the fastest worker

$$\boxed{T = 2}$$

$$\boxed{H = 0}$$

$$\boxed{T + D} \rightarrow 2$$

$$\boxed{T + H} \rightarrow 3$$

$$\boxed{D + H} \rightarrow 6$$

$$6 \rightarrow \quad \textcircled{3}$$
$$\rightarrow 2$$
$$\rightarrow \textcircled{1}$$

$$2[T + D + H] = \cancel{6}^{3}$$

$$\boxed{(T + D) + H = 3}$$

$$\boxed{H = 0}$$

Two pipes A and B can fill a tank in 24 minutes and 32 minutes respectively. If both the pipes are opened simultaneously, after how much time should B be closed so that the tank is full in 15 minutes?
(a) 12 min (b) 4 min (c) 6 min (d) 8 min

$$A \rightarrow 24$$
$$B \rightarrow 32$$

Work

$$\boxed{96} \text{ Unit} \rightarrow \boxed{4}$$
$$\rightarrow 3$$

LCM: 24, 32 → 3, 4

$$A + B$$
$$(4 \times 15) + 3x = 96$$
$$60 + 3x = 96$$
$$3x = 36$$
$$\boxed{x = 12} \text{ min}$$

A and B complete a work in 30 days. B and C complete the same work in 24 days whereas C and A complete the samework in 28 days. Based on these statements which of the following conclusions is correct?

(1) C is the most efficient and B is the least efficient

(2) B is the most efficient but the least efficient one cannot be determined

(3) C is the most efficient but the least efficient one cannot be determined

(4) C is the most efficient and A is the least efficient

HW→1

A takes twice as much time as B or thrice as much time as C to finish a piece of work. Working together, they can finish the work in 2 days. B can do the work alone in:

(a) 4 days (b) 6 days (c) 8 days (d)12 day

A, B and C can complete a work in 10, 12 and 15 days respectively. A left the work 5 days before the work was completed and B left 2 days after A had left. The number of days required to complete the whole work is?
(a) 8⅔ days (b) 6⅔ days (c) 7 days (d) 6 days

HW→2
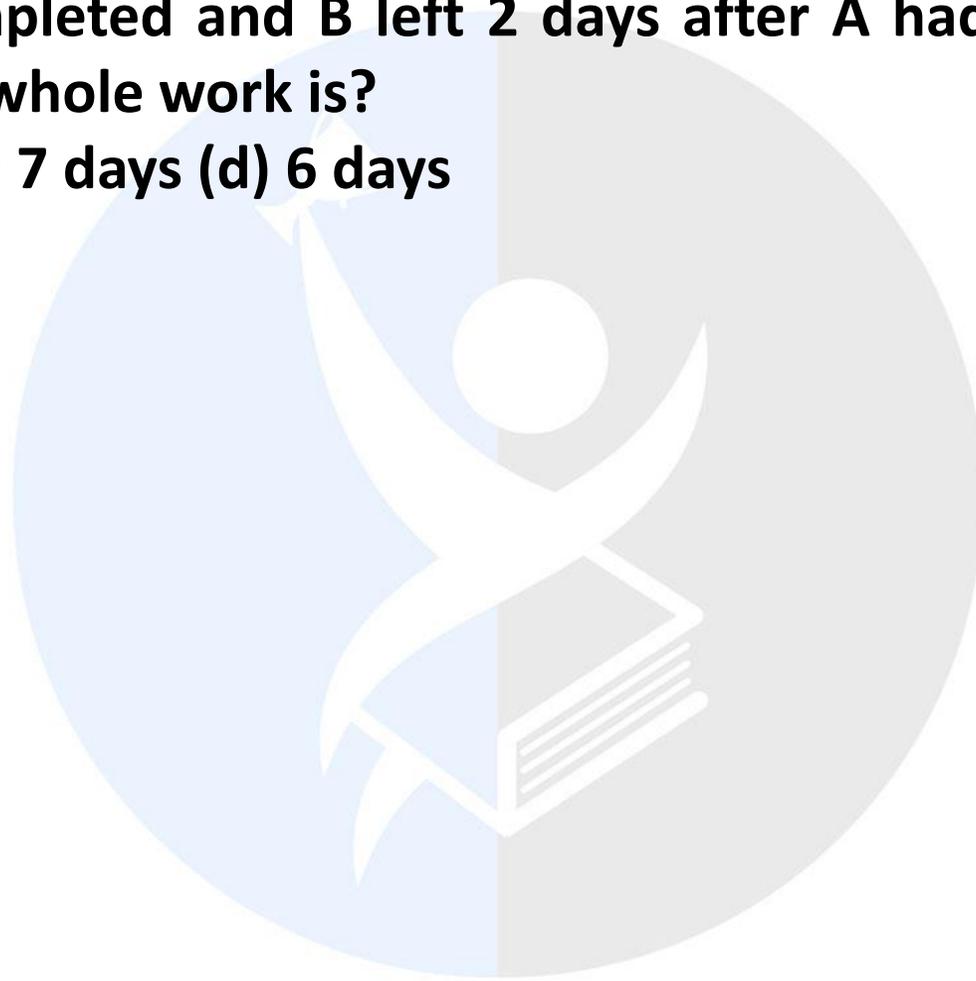
5 men can prepare (10 bags) in 6 days working 6 hours a day. Then how many days can 12 men prepare 16 bags working 8 hours per day?

a) 3   Ans

b) 4

c) 5

d) 6

$$\frac{M_1 D_1 H_1}{W_1} = \frac{M_2 D_2 H_2}{W_2}$$

→ No. of Persons
→ No. of days
→ No. of hours
work

$$\frac{M_1 D_1}{W_1} = \frac{M_2 D_2}{W_2}$$

$$\frac{5 \times 6 \times 6^3}{10_2} = \frac{12 \times D_2 \times 8^4}{16_2}$$

$$\boxed{D_2 = 3} \text{ days}$$

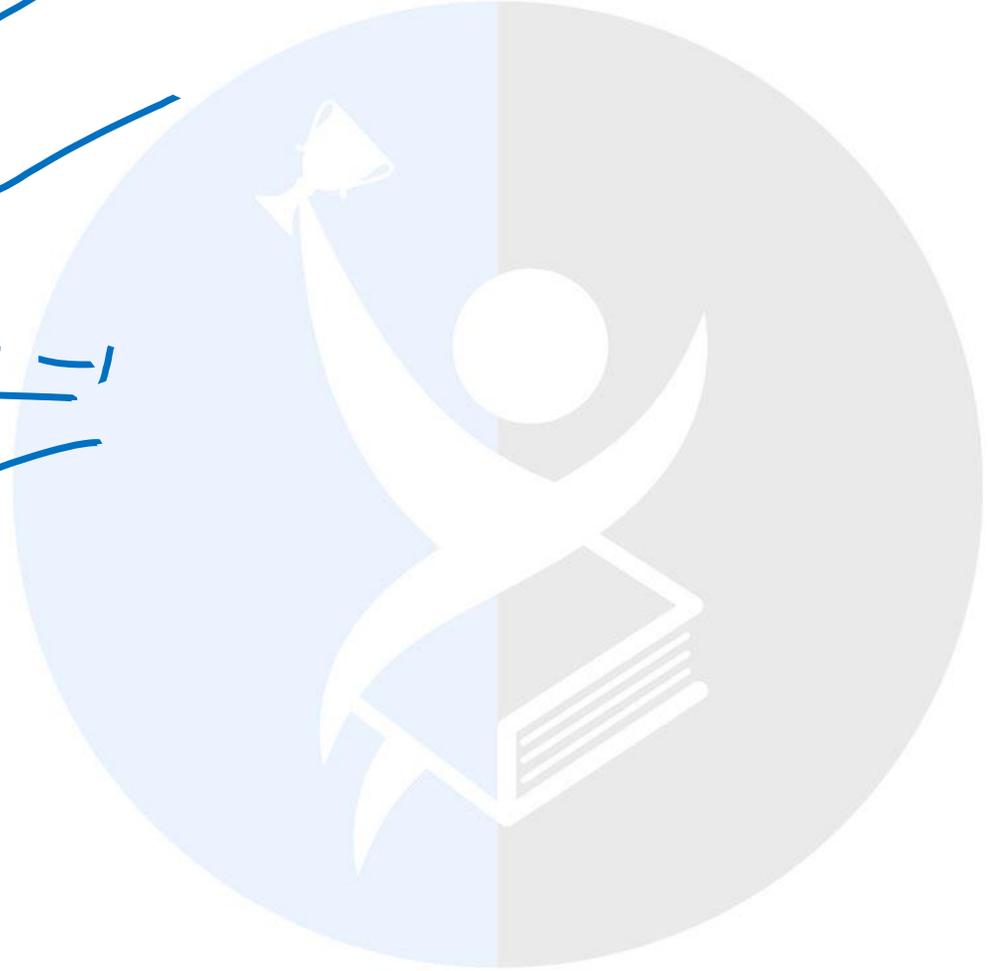① Given Efficiency →

② Total Work →

③

Asked Efficiency —1

④ Time

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?

(a) 5 days (b) 4 days (c) 6 days (d) 7 days

① Work = Work

$$(6M + 8B) \times 10 = (26M + 48B) \times 2$$ ③

$$30M + 40B = 26M + 48B$$

$$4M = 8B$$

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

② Work = $[(6 \times 2) + (8 \times 1)] \times 10$

$$= 200 \text{ unit}$$

Eff $(15M + 20B) = [15 \times 2] + [20]$

$$= 50 \text{ unit}$$

④ time = $\frac{200}{50} = 4 \text{ days}$

4 men and 6 women can complete a work in 8 days, while 3 men and 7 women can complete it in 10 days. In how many days will 10 women complete it?
(a)35 (b) 40 (c)45 (d)50

Ans

① $(4m + 6w) \times 8^4 = (3m + 7w) \times 10^5$

$16m + 24w = 15m + 35w$

$m = 11w$

$$\boxed{\frac{m}{w} = \frac{11}{①}}$$ ✓✓

② $[(4 \times 11) + (6)] \times 8$

$= 50 \times 8 = 400$ unit

③ Eff $(10w) = 10 \times 1 = ⑩$

④ time $= \frac{400}{10} = 40$ days

12 men can complete a work in 8 days. 16 women can complete the same work in 12 days. 8 men and 8 women started working and worked for 6 days. How many more men are to be added to complete the remaining work in 1 day?
(1) 8 (2) 12 (3) 16 (4) 24

5 skilled workers can build a wall in 20 days; 8 semi-skilled worker can build a well in 25 days; 10 unskilled workers can build a wall in 30 days. If a team has 2 skilled, 6 semiskilled and 5 unskilled workers, how long will it take to build the wall?

(A) 20 days (B) 18 days (C) 16 days (D) 15 days

A, B and C can complete a work in 10, 12 and 15 days respectively. A left the work 5 days before the work was completed and B left 2 days after A had left. The number of days required to complete the whole work is?
(a) 8⅔ days (b) 6⅔ days (c) 7 days (d) 6 days

A and B complete a work in 30 days. B and C complete the same work in 24 days whereas C and A complete the samework in 28 days. Based on these statements which of the following conclusions is correct?
(1) C is the most efficient and B is the least efficient
(2) B is the most efficient but the least efficient one cannot be determined
(3) C is the most efficient but the least efficient one cannot be determined
(4) C is the most efficient and A is the least efficient

5 skilled workers can build a wall in 20 days; 8 semi-skilled worker can build a well in 25 days; 10 unskilled workers can build a wall in 30 days. If a team has 2 skilled, 6 semiskilled and 5 unskilled workers, how long will it take to build the wall?
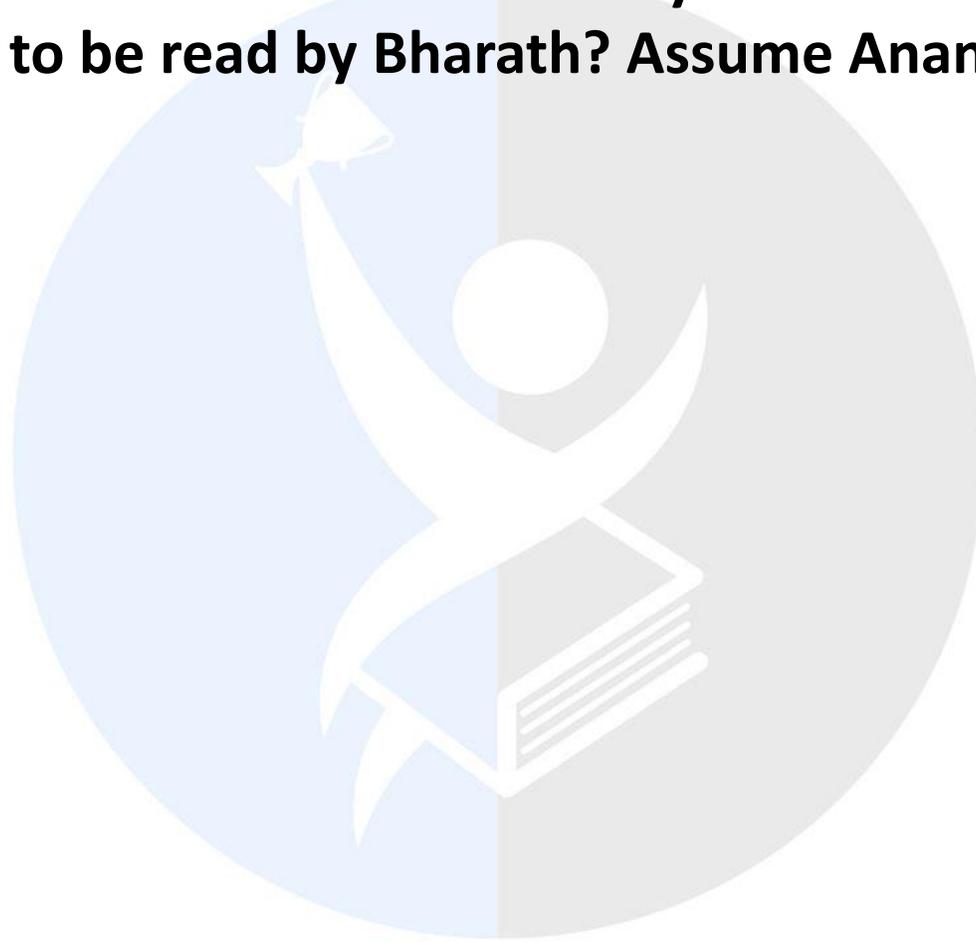
(A) 20 days (B) 18 days (C) 16 days (D) 15 days

HW 4
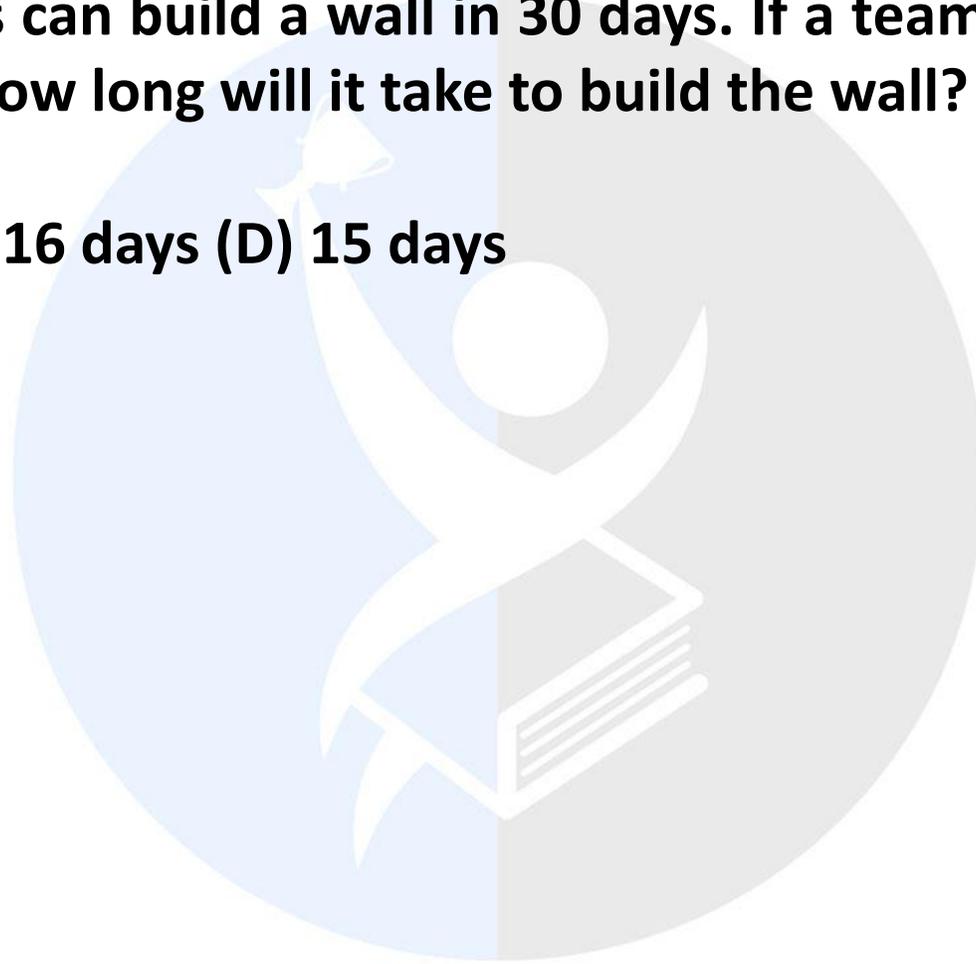
Ananth takes 6 hours and Bharath takes 4 hours to read a book. Both started reading copies of the book at the same time. After how many hours is the number of pages to be read by Ananth, twice that to be read by Bharath? Assume Ananth and Bharath read all the pages with constant pace.
(A) 1 (B) 2 (C) 3 (D) 4