DAY 25

MCA CET 2025

MATHS

TIME & WORK

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Important Concept 1a 

A = 5 days.

1 day = $\frac{1}{5}$ work

If a person completes a work in ‘n’ days

then work done in 1 day = $\frac{1}{n}$ part of the work.

Important Concept 1b 🚀

4 4 = 16

Total work done by n person in m days = mn

Important Concept 2 

Total work done is usually considered as ONE unit.

Important Concept 3 

If M_1 persons can do W_1 work in D_1 days and M_2 persons can do W_2 work in D_2 days then,

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

Important Concept 4 

If M_1 persons can do W_1 work in D_1 days working T_1 hours per day and M_2 persons can do W_2 work in D_2 days working T_2 hours per day then,

$$\frac{M_1 D_1 T_1}{W_1} = \frac{M_2 D_2 T_2}{W_2}$$

$$\frac{M_1 D_1 T_1 = M_2 D_2 T_2}{M_1 D_1 = M_2 D_2}$$

Important Concept 5 

If A can do a work in x days and B can do it work in y days the A and B working together can do same work in

$$\frac{xy}{x+y}\ days$$

Important Concept 6a 

If A, B, C can do a piece of work in x, y and z days respectively, then all of them working together can do it in

$$\frac{xyz}{xy + yz + xz}\ days$$

Important Concept 6b

If A and B can do a work in x days, B and C can do it in y days and A and C can do it in z days, then all of them working together can do it in

$$\frac{2xyz}{xy + yz + xz}\ days$$

Important Concept 6c

If A, B, C can do a piece of work in x, y and z days respectively, the contract of the work is for Rs. r then

$$Share\ of\ A = Rs.\frac{ryz}{xy + yz + xz}$$

$$Share\ of\ B = Rs.\frac{rxz}{xy + yz + xz}$$

$$Share\ of\ C = Rs.\frac{rxy}{xy + yz + xz}$$

Important Concept 6d

If A can do a work in x days. With help of B, A can do it in y days. If they get Rs. a for the work, then

$$Share\ of\ A = \frac{ay}{x}$$

$$Share\ of\ B = \frac{a(x-y)}{x}$$

Important Concept 7a

If A is k times efficient than B and is therefore able to finish the work in ‘n’ days less than B then,

A and B working together can finish the work in

$$\frac{kn}{k^2 - 1} \; days$$

Important Concept 7b

If A is k times efficient than B and is therefore able to finish the work in ‘n’ days less than B then,

A working alone can finish work in

$$\frac{n}{k-1}\ days$$

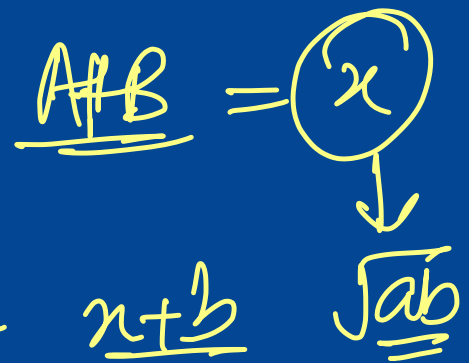
Important Concept 7c 

If A is k times efficient than B and is therefore able to finish the work in ‘n’ days less than B then,

B working alone can finish work in

$$\frac{kn}{k-1}\ days$$

Important Concept 8



If A working alone takes ‘a’ days more than A and B working together. B alone takes ‘b’ days more than A and B working together. Then number of days taken by A and B working together to finish the job is $\sqrt{ab}$

Important Concept 9 

If A and B can complete a work in x days and A alone can finish in y days, then number of days required by B to complete the work alone will be $\frac{xy}{y-x}$ days.

Important Concept 10a

Wages

A can do a work in d_1 days and B can do same work in d_2 days, the the ratio of the wages of A and B are:

$$\text{A's Share : B's Share} = \frac{1}{d_1} : \frac{1}{d_2} = d_2 : d_1$$

$$A : B = d_2 : d_1$$

Important Concept 10b

A can do a work in d_1 days and B can do same work in d_2 days and C can do it in d_3 days, the the ratio of the wages of A, B, and C are:

A's Share : B's Share: C's Share = $\frac{1}{d_1} : \frac{1}{d_2} : \frac{1}{d_3} = d_2d_3 : d_1d_3 : d_1d_2$

$d_2d_3 : d_1d_3 : d_1d_2$

A and B working together can finish a piece of work in 12 days, while A alone can finish it in 30 days. In how many days can B alone finish the work?

(a) 18 days

(b) 20 days

(c) 24 days

(d) 25 days

$A+B = 12 \text{ days} = x$

$A = 30 = y$

$$\frac{xy}{y-x} = \frac{12 \times 30}{18} = 20$$

A can do a piece of work in x days and B can do the same work in 3x days. To finish the work together, they take 12 days. What is the value of x?

(a) 8 (b) 10 (c) 12 (d) 16

$$\frac{xy}{x+y} = 12$$

A+B

x y

16 16×3 = 48

$$\frac{x \cdot 3x}{4x} = 12$$

$$x = \frac{12 \times 4}{3} = 16$$

Tushar takes 6 h to complete a piece of work, while Amar completes the same work in 10 h. If both of them work together, then what is the time required to complete the work?

(a) 3 h

(b) 3 h 15 min

(c) 3 h 30 min

(d) 3 h 45 min

$$\frac{xy}{x+y} = \frac{\overset{3}{\cancel{6}} \times \overset{5}{\cancel{10}}}{\cancel{16}_{4}} = \frac{15}{4}$$

$= 3.75$ hrs.

3 hr. 45 mins

If X and Y can complete a piece of work in 20 days. Y and Z can complete the same work in 12 days, while Z and X could do the same in 15 days. How many days would be needed to complete the work by X, Y and Z together?

(a) 10 days (b) 12 days (c) 8 days (d) 5 days

$$\frac{2xyz}{xy + yz + xz}$$

$$= \frac{2 \times 20 \times 12 \times 15}{240 + 180 + 300} = \frac{2 \times 20 \times 12 \times 15}{720} = 10 \text{ days}$$

(y)

X can complete a job in 12 days. If X and Y work together, they can complete the job in $6\frac{2}{3}$ days. Y alone can complete the job in

(a) 10 days (b) 12 days (c) 15 days (d) 18 days

$$\frac{xy}{y-x} = \frac{\frac{20}{3} \times 12^{4}}{12 - \frac{20}{3}} = \frac{80}{\frac{36-20}{3}}$$

$$\frac{\overset{5}{\cancel{80}} \times 3}{\cancel{16}_{1}} = 15$$

$$= \frac{80}{\frac{16}{3}}$$

A, B and C can do a job working alone in 12, 16 and 24 days, respectively. In how many days they can do the job, if they worked together?

(a) 16/3 (b) 15/4 (c) 17/3 (d) 19/4

144
240

$$\frac{xyz}{xy+yz+xz} = \frac{12\times16\times24}{192+384+288}$$

$$= \frac{2\,\cancel{6}_{\cancel{12}}\times\cancel{16}^{\cancel{4}}\times\cancel{24}^{8}}{\cancel{864}\;\cancel{216}\;\cancel{54}\;\cancel{27}\;9\;3} = \frac{16}{3}$$

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?

(a) 5 days (b) 6 days (c) 7 days (d) 10 days

$A+B = 3$ days.

$A+B = 2$ days.

Work done in 1 day $= \frac{1}{3}$

2 days $= \frac{2}{3}$

Remaining $= \frac{1}{3}$

A requires 2 days $= \frac{1}{3}$

6 days $= 1$ - work.

$B = \frac{3 \times 6}{3} = 6$ days

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

A and B can do a job together in 12 days. A is 2 times as efficient as B. In how many days can B alone complete the work?

(a) 36 (b) 12 (c) 18 (d) 9

$A = 2B$

$B = 4$

$A = 2$

$\frac{xy}{y+x} = 12$

$\frac{2x^2}{3x} = 12$

$x = \frac{12 \times 3}{2} = 18$

$x = 18$ days

$2x = 2 \times 18 = 36$ days.

A certain number of persons can complete a work in 34 days working 9 hours a day. If the number of persons is decreased by 40%, then how many hours a day should the remaining persons work to complete the work in 51 days ?

(a) 9 (b) 8 (c) 12 (d) 10

$M_1 D_1 T_1 = M_2 D_2 T_2$

$M_2 = M_1 - \frac{40}{100} M_1$

$M_1 \times 34 \times 9 = \frac{6}{10} \times M_1 \times 51 \times T_2$

$M_2 = \frac{60}{100} M_1$

$\frac{34 \times 9 \times 10}{6 \times 51} = T_2$

$T_2 = 10$ hours per day

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