Time and Work: 13 Important Shortcuts

Time and Work problems are most frequently asked problems in quantitative aptitude.Technically speaking, Work is the quantity of energy transferred from one system to another but for question based on this topic Work is defined as the amount of job assigned or the amount of job actually done.Problem on work are based on the application of concept of ratio of time and speed.Work is always considered as a whole or one.

There exists an analogy between the time speed and distance. To solve these problems very quickly, you should understand the concept of Time and Work and some shortcut methods.If a man can do a piece of work in 5 days, then he will finish 1/5th of the work in one day. If a man can finish 1/5th of the work in one day then he will take 5 days to complete the work. If a man 5/6th of work in one hour then he will take 6/5 hours to complete the full work. If A works three times faster than B then A takes 1/3rd the time taken by B.

Here are some shortcut rules which can be very useful while solving Time and Work problems.

Trick-1: M1 men can do a piece of W1 work in D1 days. the number of days will required to complete the work by M2 men is given by (M1*D1)/W1 = (M2*D2)/W2

Ex: 15 men can do a piece of work in 50 days.how many days will required to complete the work by 10 men ?

a. 55 b. 65 c. 75 d. 70

Sol: M1=15, M2=10 & D1=50, D2=?

W1=W2=1

So, D2=[15*50]/10=75 days

Trick-2: M1 men can do a piece of W1 work H1 hours per day in D1 days. the number of days will required to complete the work by M2 men are working H2 hours per day is given by

(M1*D1*H1)/W1 = (M2*D2*H2)/W2

Ex: 24 men can do a piece of work 8 hours per day in 50 days.how many days will required to complete the work by 16 men, are working 6 hours per day ?

a. 55 b. 50 c. 75 d. 100

Sol: M1=24, M2=16 & D1=50, D2=?

H1=8, H2=6 & W1=W2=1

So, D2=[24*50*8]/(6*16)=100 days

Trick-3: 'A' can do a piece of work in 'x' days & 'B' can do same piece of work in 'y' day. so,'A' and 'B' together can complete the work in [x*y]/[x+y] days.

Ex: A can do a piece of work in 75 days & B can do a piece of work in 50 days. how many days will required to complete the work by A and B ?

a. 30 b. 25 c. 125 d. 100

Sol: A+B in [75*50]/[75+50] = 30 days

Trick-4:

'A' in 'x' days & 'A+B' in 'y' days

So, B in [x*y]/[x-y]

Ex: A can do a piece of work in 75 days & A&B can do a piece of work in 50 days. how many days will required to complete the work by B alone ?

a. 30 b. 25 c. 125 d. 150

Sol: A+B in [75*50]/[75-50] = 150 days

Trick-5:

'A' in 'x' days, 'B' in 'y' days &'C' in 'z' days

So, A+B+C in [x*y*z]/[xy+yz+xz]

Ex: A can do a piece of work in 20 days, B can do a piece of work in 15 days & C can do a piece of work in 10 days. how many days will required to complete the work by A, B and C ?

a. 20/3 b. 60/13 c. 30/13 d. 30

Sol: A+B+C in [20*15*10]/[(20*15)+(15*10)+(10*20)] = 60/13 days

Trick-6:

'A' in 'x' days, 'B' in 'y' days & 'A+B+C' in 'z' days

So, C in [x*y*z]/[xy-yz-xz]

Ex: A can do a piece of work in 30 days, B can do a piece of work in 20 days & A,B &C combinely can do a piece of work in 60/11 days. how many days will required to complete the work by C alone ?

a. 20 b. 10 c. 40 d. 30

Sol: A+B+C in [30*20*60/11]/[(20*30)-(30*60/11)-(20*60/11)] = 10 days

Trick-7:

'A+B' in 'x' days, 'B+c' in 'y' days & 'A+C' in 'z' days

So, A+B+C in [2*x*y*z]/[xy+yz+xz]

Ex: A and B can do a piece of work in 30 days, B and C can do a piece of work in 20 days, C and A can do a piece of work in 10 days. how many days will required to complete the work by A, B and C ?

a.120/13 b.60/11 c.120/11 d.60/13

Sol: A+B+C in [30*20*10]/[(30*20)+(20*10)+(10*30)] =120/11 days

Trick-8:

i. Certain men in 'D' days, if 'x' men less then 'd' days more.

Orginally worked men= [x*(D+d)]/d

Ex: Certain men complete a work in 10 days.if there are 5 men are less,it could be finished in 5 days more.then,number of men originally worked ?

a.10 b.15 c.20 d.5

Sol: Originally worked = [5*(10+5)]/5

= 15 men

ii. Certain men in 'D' days, if 'x' men more then 'd' days less.

Orginally worked men= [x*(D-d)]/d

Ex: Certain men complete a work in 10 days.if there are 5 men are more,it could be finished in 5 days less.then,number of men originally worked ?

a.10 b.15 c.20 d. 5

Sol: Originally worked = [5*(10-5)]/5

= 5 men

Trick-9:

i. 'A' in 'X' days.but,worked for 'a'days. Remaining work 'B' in 'b' days.so, 'A+B' =[b*x]/(b+x-a].

Ex: A can complete a work in 20 days.but, A worked for 5 days. Remaining work completed by B in 5 days.so, Both A and B can complete's the work in ?

a. 10 b. 5 c. 15 d. 20

Sol: A+B = [20*5]/(5+20-5)= 5 days

ii. 'A' in 'x' days & 'B' in 'y' days

A worked for 'a' days, remaining work by 'B' alone

= [(x-a)/x]*y

Ex: A can complete a work in 20 days, B can complete a work in 15 days. but, A worked for 5 days. Remaining work completed by B alone in how days ?

a. 45/4 b. 11 c. 44 d. 20

Sol: B = [(20-5)/20]*15= 45/4 days

iii. 'A' in 'X' days.but,worked for 'a'days. 'A+B' in 'b' days.so, Remaining work 'B' in

=[b*(x-a)]/ (b+x)

Ex: A can complete a work in 20 days.but, A worked for 5 days. A and B can do in 5 days.so, B can complete's the work in ?

a. 3 b. 5 c. 15 d. 8

Sol: A+B = [(20-5)*5]/(5+20)= 3 days

Trick-10:

'A' in 'x' days & 'B' in ' y' days. After 'a' days B joined with A. Work complet in

= a + [y*(x-a)/(x+y)]

Ex: A can do a piece of work in 75 days & B can do a piece of work in 50 days. After 25 days B joined with A.how many days will required to complete the work ?

a. 20 b. 25 c. 45 d. 10

Sol: = 25+[50*(75-25)/(75+50)] = 30 days

Trick-11:

'A' in 'x' days & 'B' in ' y' days.Both worked for 'a' days . then,A left the Work.alone 'B' complet the remain work

= y-[a*(x+y)]/x days

Ex: A can do a piece of work in 75 days & B can do a piece of work in 50 days. Both are worked 10 days, A left the work.how many days will required to complete the remaining work B alone ?

a. 20 b. 36 c. 40 d. 110/3

Sol: = 50-[10*(75+25)/(75)] = 110/3 days

Trick-12:

'x' men or 'y' women or 'z' boys can do a piece of work in 'D' days.then,1 men+1 women+1 boy can do same work in [D*(x*y*z)]/[(x*y)+(y*z)+(x*z)] days.

Ex: 1 men or 2 women or 3 boys can do a piece of work in 10 days.then, 1 men+1 women+1 boy can do same piece of work in how many days ?

a. 30/11 b. 60/11 c. 120/11 d.60

Sol:

= 10*(1*2*3)/[(1*2)+(1*3)+(2*3)] = 60/11 days

Trick-13:

'x1' men or 'y1' women can do a piece of work in 'D' days.'x2' men and 'y2' women can complete in

[D*(x1*y1)]/[(x2*y1)*(y2*x1)] days.

Ex: 5 men or 10 women can do a piece of work in 15 days.5 men and 5 women can complete the work in how many days ?

a. 10 b. 20 c. 30 d. 40

Sol:

= 15*(5*10)/[(5*5)+(5*10)] =10 days