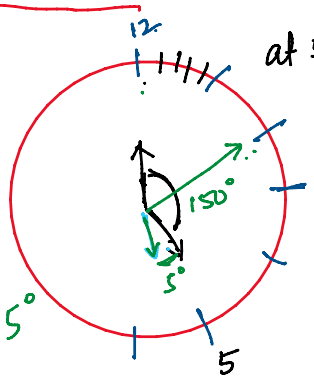
A clock is started at noon. By 10 minutes past 5, the hour hand has turned through:

(A) 145°

(B) 150°

(C) 155°

(D) 160°



at 5 pm.

hr hand → $\frac{60}{12} = 5°$

60 min → 360°.

1 min → 6°.

25 min → 150°.

10 min → 60°.

When the hr hand travels 5 min the min hand travels 60 min

$S_{hr} : S_{min} = 1 : 12$.

A watch which gains 5 seconds in 3 minutes was set right at 7 a.m. In the afternoon of the same day, when the watch indicated quarter past 4 o'clock, the true time is:

(A) $59\frac{7}{12}$ min. past 3

(B) 4 p.m.

(C) $58\frac{7}{11}$ min. past 3

(D) $2\frac{3}{11}$ min. past 4

4:15

7am → 4pm

9 hrs.

In 3 min it gains 5 sec.

In 60 " " $5 \times 20 = 100$ sec.
(1 hr)

In 9 hrs " " $100 \times 9 = 900$ sec

900 sec = $\frac{900}{60} = 15$ min

Actual time – 4 pm

clock time – 4:15 pm.

In 1440 min

→ $1\frac{5}{11} \times \frac{1}{64} \times 60 \times 24$.

In 64 min → $1\frac{5}{11}$ min

1 " → $1\frac{5}{11} \times \frac{1}{64}$ min

1 day = 60×24 min. = 1440 min

How much does a watch lose per day, if its hands coincide every 64 minutes?

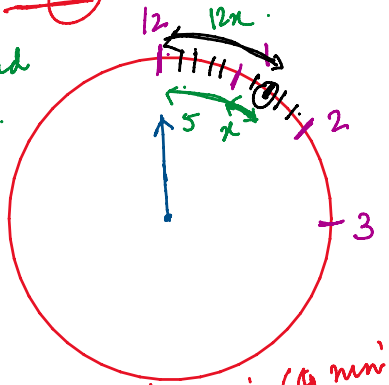
(A) $32\frac{8}{11}$ min.

(B) $36\frac{5}{11}$ min.

(C) 90 min.

(D) 96 min.

The hr and min hand of a normal clock coincides after every $65\frac{5}{11}$ min



hr hand → (5+x) div

min " → (60 + 5 + x) div.

$65 + x = 12(5 + x)$

$65 + x = 60 + 12x$.

$11x = 5$

$x = \frac{5}{11}$ div $= \frac{5}{11}$ min

$\frac{15}{11} \times \frac{60 \times 24}{64} = \frac{360}{11} = 32\frac{8}{11}$ min

Time lost = $65\frac{5}{11} - 64$

$= 1\frac{5}{11}$ min.

$1\frac{5}{11}$ min is lost in 64 min

$60 + 5 + x$.

$= 65\frac{5}{11}$ min.

A train can travel 50% faster than a car. Both start from point A at the same

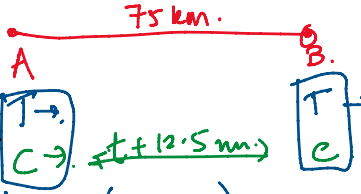
A train can travel 50% faster than a car. Both start from point A at the same time and reach point B 75 kms away from A at the same time. On the way, however, the train lost about 12.5 minutes while stopping at the stations. The speed of the car is:

(A) 100 kmph

(B) 110 kmph

(C) 120 kmph

(D) 130 kmph



$S_C = \frac{50}{25}$ km/min $= 2$ km/min $= 120$ km/hr

total time taken by the train $= (t+12.5)$ mins.

S_T = Actual Speed of the train $= \frac{75}{t}$ km/min.

$\frac{S_T}{S_C} = \frac{1.5}{1} = \frac{3}{2}$.

$S_C = \frac{75}{t+12.5}$ km/min

$2(t+12.5) = 3t$.

$t = 25$ mins.

$S_C = \frac{2}{3} S_T = \frac{2}{3} \times \frac{75}{t} = \frac{50}{t}$ km/min

$\frac{2}{\frac{50}{t}} = \frac{3}{\frac{75}{t+12.5}}$

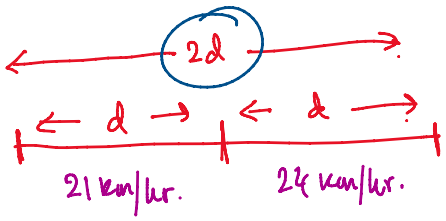
A man complete a journey in 10 hours. He travels first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km.

(A) 220 km

(B) 224 km

(C) 230 km

(D) 234 km



Time = Distance / Speed

$t_1 = \frac{d}{21}$ hr $\quad t_2 = \frac{d}{24}$ hrs.

$t_1 + t_2 = 10$.

$\frac{d}{21} + \frac{d}{24} = 10$.

$\frac{8d}{168} + \frac{7d}{168} = 10$.

$24 \times 7 = 168$

$15d = 168 \times 10$.

$d = \frac{168 \times 10^{2}}{15} = 112$ km

In covering a distance of 30 km, Abhay takes 2 hours more than Sameer. If Abhay doubles his speed, then he would take 1 hour less than Sameer. Abhay's speed is:

(A) 5 kmph

(B) 6 kmph

(C) 6.25 kmph

(D) 7.5 kmph

$d = 30$ km.

S → t hrs. Speed of Sameer = S.

A → $(t+2)$ hrs. " " Abhay = A.

$S = \frac{30}{t}$ $\quad A = \frac{30}{t+2}$

If Speed of Abhay = 2A.

time taken by Abhay = $(t-1)$ hrs.

$2A = \frac{30}{t-1}$

$t+2 = 2(t-1)$

$t+2 = 2t-2$

$t = 4$ hrs

$A = \frac{30}{t+2} = \frac{30}{6} = 5$ km/hr

$\frac{2A}{A} = \frac{\frac{30}{t-1}}{\frac{30}{t+2}} = \frac{t+2}{t-1}$

In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/hr and the time of flight increased by 30 minutes. The duration of the flight is:

(A) 1 hour

(B) 2 hours

(C) 3 hours

(D) 4 hours

$\frac{1}{2}$ hr.

$d = 600$ km.

Normal speed $= x$ km/hr, $= 600$

Normal time $= \frac{600}{x}$ hrs.

reduced speed $= (x - 200)$ km/hr.

increased time $= \left(\frac{600}{x} + \frac{1}{2}\right)$ hrs.

$\frac{600}{600} = 1$ hr

$(x-200)(1200+x) = 1200x$.

$1200x + x^2 - 1200 \times 200 - 200x = 1200x$

$(x-200)\left(\frac{600}{x} + \frac{1}{2}\right) = 600$.

$(x-200)\left(\frac{1200+x}{2x}\right) = 600$.

$x^2 - 200x - 1200 \times 200 = 0$.

$ax^2 + bx + c = 0$

$x = \frac{200 \pm \sqrt{40000 + 800 \times 1200}}{2}$.

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.

$= \frac{200 \pm 1000}{2}$

$= \frac{1200}{2} = 600$

40000
960000
1000000.
6
$= 10$