1. A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?

   A. 3.6

   B. 7.2

   C. 8.4

   D. 10

   Answer: Option **B**
   Explanation:

   $$\text{Speed} = \left(\frac{600}{5 \times 60}\right) \text{m/sec.}$$

   = 2 m/sec.

   Converting m/sec to km/hr (see important formulas section)

   $$= \left(2 \times \frac{18}{5}\right) \text{km/hr}$$

   = 7.2 km/hr.

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2. An aeroplane covers a certain distance at a speed of 240 kmph in 5 hours. To cover the same distance in $1\frac{2}{3}$ hours, it must travel at a speed of:

   A. 300 kmph

   B. 360 kmph

   C. 600 kmph

   D. 720 kmph

   Answer: Option **D**
   Explanation:

   Distance = (240 x 5) = 1200 km.

   Speed = Distance/Time

   Speed = 1200/(5/3) km/hr. [We can write $1\frac{2}{3}$ hours as 5/3 hours]

   ∴ Required speed = $\left(1200 \times \frac{3}{5}\right)$ km/hr = 720 km/hr.

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3. If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is:

A. 50 km

B. 56 km

C. 70 km

D. 80 km

Answer: Option **A**
Explanation:
Let the actual distance travelled be x km.

Then, $\dfrac{x}{10} = \dfrac{x + 20}{14}$

$\Rightarrow 14x = 10x + 200$

$\Rightarrow 4x = 200$

$\Rightarrow x = 50$ km.

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4. 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

Answer: Option **C**
Explanation:
Let speed of the car be x kmph.

Then, speed of the train = $\dfrac{150}{100}x = \left(\dfrac{3}{2}x\right)$ kmph.

$\therefore \dfrac{75}{x} - \dfrac{75}{(3/2)x} = \dfrac{125}{10 \times 60}$

$\Rightarrow \dfrac{75}{x} - \dfrac{50}{x} = \dfrac{5}{24}$

$\Rightarrow x = \left(\dfrac{25 \times 24}{5}\right) = 120$ kmph.

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5. Excluding stoppages, the speed of a bus is 54 kmph and including stoppages, it is 45 kmph. For how many minutes does the bus stop per hour?

A. 9

B. 10

C. 12

D. 20

Answer: Option **B**

Explanation:

Due to stoppages, it covers 9 km less.

Time taken to cover 9 km = $\left(\dfrac{9}{54} \times 60\right)_{\text{min}}$ = 10 min.

6. 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

   Answer: Option **A**

   Explanation:

   Let the duration of the flight be x hours.

   Then, $\dfrac{600}{x} - \dfrac{600}{x + (1/2)} = 200$

   $\Rightarrow \dfrac{600}{x} - \dfrac{1200}{2x + 1} = 200$

   $\Rightarrow x(2x + 1) = 3$

   $\Rightarrow 2x^2 + x - 3 = 0$

   $\Rightarrow (2x + 3)(x - 1) = 0$

   $\Rightarrow x = 1$ hr.   [neglecting the -ve value of x]

7. 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

   Answer: Option **B**

   Explanation:

   $\dfrac{(1/2)x}{21} + \dfrac{(1/2)x}{24} = 10$

   $\Rightarrow \underline{x} + \underline{x} = 20$

$$\frac{21}{} \qquad \frac{24}{}$$

$\Rightarrow 15x = 168 \times 20$

$\Rightarrow x = \left(\dfrac{168 \times 20}{15}\right) = 224$ km.

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8. The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 km in 4 hours, then the speed of the first train is:

    A. 70 km/hr

    B. 75 km/hr

    C. 84 km/hr

    D. 87.5 km/hr

    Answer: Option **D**
    Explanation:
    Let the speed of two trains be $7x$ and $8x$ km/hr.

    Then, $8x = \left(\dfrac{400}{4}\right) = 100$

    $\Rightarrow x = \left(\dfrac{100}{8}\right) = 12.5$

    $\therefore$ Speed of first train = (7×12.5) km/hr = 87.5 km/hr.

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9. A man on tour travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. The average speed for the first 320 km of the tour is:

    A. 35.55 km/hr

    B. 36 km/hr

    C. 71.11 km/hr

    D. 71 km/hr

    Answer: Option **C**
    Explanation:

    Total time taken = $\left(\dfrac{160}{64} + \dfrac{160}{80}\right)$ hrs. $= \dfrac{9}{2}$ hrs.

    $\therefore$ Average speed = $\left(320 \times \dfrac{2}{9}\right)$ km/hr $= 71.11$ km/hr.

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10.
    A car travelling with $\dfrac{5}{7}$ of its actual speed covers 42 km in 1 hr 40 min 48 sec. Find the actual speed of the car.

A. $17\dfrac{6}{7}$ km/hr

B. 25 km/hr

C. 30 km/hr

D. 35 km/hr

Answer: Option **D**
Explanation:

Time taken = 1 hr 40 min 48 sec = 1 hr $40\dfrac{4}{5}$ min = $1\dfrac{51}{75}$ hrs = $\dfrac{126}{75}$ hrs.

Let the actual speed be x km/hr.

Then, $\dfrac{5}{7}x \times \dfrac{126}{75} = 42$

$\Rightarrow x = \left(\dfrac{42 \times 7 \times 75}{5 \times 126}\right) = 35$ km/hr.

11. 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

Answer: Option **A**
Explanation:
Let Abhay's speed be x km/hr.

Then, $\dfrac{30}{x} - \dfrac{30}{2x} = 3$

$\Rightarrow 6x = 30$
$\Rightarrow x = 5$ km/hr.

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12. Robert is travelling on his cycle and has calculated to reach point A at 2 P.M. if he travels at 10 kmph, he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 P.M.?

A. 8 kmph

B. 11 kmph

C. 12 kmph

D. 14 kmph

Answer: Option **C**
Explanation:
Let the distance travelled by x km.

Then, $\dfrac{x}{10} - \dfrac{x}{15} = 2$

$\Rightarrow 3x - 2x = 60$

$\Rightarrow x = 60$ km.

Time taken to travel 60 km at 10 km/hr = $\left(\dfrac{60}{10}\right)_{hrs}$ = 6 hrs.

So, Robert started 6 hours before 2 P.M. *i.e.,* at 8 A.M.

$\therefore$ Required speed = $\left(\dfrac{60}{5}\right)_{kmph.}$ = 12 kmph.

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13. It takes eight hours for a 600 km journey, if 120 km is done by train and the rest by car. It takes 20 minutes more, if 200 km is done by train and the rest by car. The ratio of the speed of the train to that of the cars is:

   A. 2 : 3

   B. 3 : 2

   C. 3 : 4

   D. 4 : 3

Answer: Option **C**
Explanation:
Let the speed of the train be x km/hr and that of the car be y km/hr.

Then, $\dfrac{120}{x} + \dfrac{480}{y} = 8 \qquad \Rightarrow \dfrac{1}{x} + \dfrac{4}{y} = \dfrac{1}{15}$ ....(i)

And, $\dfrac{200}{x} + \dfrac{400}{y} = \dfrac{25}{3} \qquad \Rightarrow \dfrac{1}{x} + \dfrac{2}{y} = \dfrac{1}{24}$ ....(ii)

Solving (i) and (ii), we get: $x = 60$ and $y = 80$.

$\therefore$ Ratio of speeds = 60 : 80 = 3 : 4.

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14. A farmer travelled a distance of 61 km in 9 hours. He travelled partly on foot @ 4 km/hr and partly on bicycle @ 9 km/hr. The distance travelled on foot is:

   A. 14 km

   B. 15 km

   C. 16 km

   D. 17 km

Answer: Option **C**
Explanation:

Let the distance travelled on foot be x km.
Then, distance travelled on bicycle = $(61 - x)$ km.

So, $\dfrac{x}{4} + \dfrac{(61 - x)}{9} = 9$

$\Rightarrow 9x + 4(61 - x) = 9 \times 36$
$\Rightarrow 5x = 80$
$\Rightarrow x = 16$ km.

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15. A man covered a certain distance at some speed. Had he moved 3 kmph faster, he would have taken 40 minutes less. If he had moved 2 kmph slower, he would have taken 40 minutes more. The distance (in km) is:

    A. 35

    B. $36\dfrac{2}{3}$

    C. $37\dfrac{1}{2}$

    D. 40

Answer: Option **D**

Explanation:

Let distance = x km and usual rate = y kmph.

Then, $\dfrac{x}{y} - \dfrac{x}{y + 3} = \dfrac{40}{60} \quad \Rightarrow \quad 2y(y + 3) = 9x$ ....(i)

And, $\dfrac{x}{y - 2} - \dfrac{x}{y} = \dfrac{40}{60} \quad \Rightarrow \quad y(y - 2) = 3x$ ....(ii)

On dividing (i) by (ii), we get: $x = 40$.