

Distance - Rate - Time Word Problems

- 1) An aircraft carrier made a trip to Guam and back. The trip there took three hours and the trip back took four hours. It averaged 6 km/h on the return trip. Find the average speed of the trip there.

$$\begin{array}{l}
 \xrightarrow{3 \text{ hrs } (x \text{ km/hr})} \\
 \xleftarrow{4 \text{ hrs } (6 \text{ km/hr})} \\
 3x = 4(6) \\
 3x = 24 \\
 \frac{3x}{3} = \frac{24}{3} \\
 \boxed{x = 8 \text{ km/hr}}
 \end{array}$$

- 2) A passenger plane made a trip to Las Vegas and back. On the trip there it flew 432 mph and on the return trip it went 480 mph. How long did the trip there take if the return trip took nine hours?

$$\begin{array}{l}
 \xrightarrow{432 \text{ mph } (x \text{ hrs})} \\
 \xleftarrow{480 \text{ mph } (9 \text{ hrs})} \\
 432x = 480(9) \\
 432x = 4320 \\
 \frac{432x}{432} = \frac{4320}{432} \\
 \boxed{x = 10 \text{ hrs}}
 \end{array}$$

- 3) A cattle train left Miami and traveled toward New York. 14 hours later a diesel train left traveling at 45 km/h in an effort to catch up to the cattle train. After traveling for four hours the diesel train finally caught up. What was the cattle train's average speed?

$$\begin{array}{l}
 \text{Cattle} \xrightarrow{18 \text{ hrs}} x \text{ km/hr} \\
 \text{Diesel} \xrightarrow{4 \text{ hrs}} 45 \text{ km/hr} \\
 18 \text{ hrs equal} \\
 18x = 4(45) \\
 18x = 180 \\
 \frac{18x}{18} = \frac{180}{18} \\
 \boxed{x = 10 \text{ km/hr}}
 \end{array}$$

- 4) Jose left the White House and drove toward the recycling plant at an average speed of 40 km/h. Rob left some time later driving in the same direction at an average speed of 48 km/h. After driving for five hours Rob caught up with Jose. How long did Jose drive before Rob caught up?

$$\begin{array}{l}
 \text{Jose} \xrightarrow{40 \text{ km/hr } (x \text{ hrs})} \\
 \text{Rob} \xrightarrow{48 \text{ km/hr } (5 \text{ hrs})} \\
 48(5) = 40(x) \\
 240 = 40x \\
 \frac{240}{40} = \frac{40x}{40} \\
 \boxed{x = 6 \text{ hrs}}
 \end{array}$$

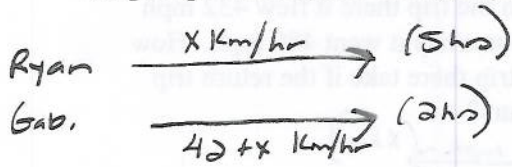
- 5) A cargo plane flew to the maintenance facility and back. It took one hour less time to get there than it did to get back. The average speed on the trip there was 220 mph. The average speed on the way back was 200 mph. How many hours did the trip there take?

$$\begin{array}{l}
 \xrightarrow{x-1} 220 \text{ mph} \\
 \xleftarrow{x} 200 \text{ mph} \\
 220(x-1) = 200x \\
 220x - 220 = 200x \\
 -220x \quad -220x \\
 -220 = -20x \\
 \frac{-220}{-20} = \frac{-20x}{-20} \\
 x = 11 \text{ hrs back }^{-1-} \\
 \boxed{10 \text{ hrs there}}
 \end{array}$$

- 6) Kali left school and traveled toward her friend's house at an average speed of 40 km/h. Matt left one hour later and traveled in the opposite direction with an average speed of 50 km/h. Find the number of hours Matt needs to travel before they are 400 km apart.

$$\begin{array}{l}
 \xleftarrow{50 \text{ km/hr } (x)} \quad \xrightarrow{40 \text{ km/hr } (x+1 \text{ hr})} \\
 50x + 40(x+1) = 400 \\
 50x + 40x + 40 = 400 \\
 90x = 360 \\
 \frac{90x}{90} = \frac{360}{90} \\
 \boxed{x = 4 \text{ hrs}}
 \end{array}$$

- 7) Ryan left the science museum and drove south. Gabriella left three hours later driving 42 km/h faster in an effort to catch up to him. After two hours Gabriella finally caught up. Find Ryan's average speed.



$$2(42+x) = 5x$$

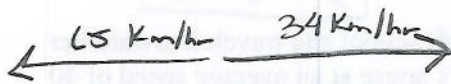
$$84 + 2x = 5x$$

$$\begin{array}{r} -2x \quad -2x \\ \hline \end{array}$$

$$\frac{84}{3} = \frac{3x}{3}$$

$$\boxed{x = 28 \text{ km/hr}}$$

- 9) Chelsea left the White House and traveled toward the capital at an average speed of 34 km/h. Jasmine left at the same time and traveled in the opposite direction with an average speed of 65 km/h. Find the number of hours Jasmine needs to travel before they are 59.4 km apart.



$$65x + 34x = 59.4$$

$$\frac{99x}{99} = \frac{59.4}{99}$$

$$\boxed{x = 0.6 \text{ hrs}}$$

- 8) A submarine left Hawaii two hours before an aircraft carrier. The vessels traveled in opposite directions. The aircraft carrier traveled at 25 mph for nine hours. After this time the vessels were 280 mi. apart. Find the submarine's speed.



$$25(9) + 11x = 280$$

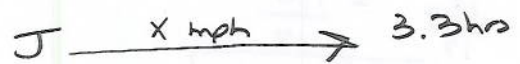
$$225 + 11x = 280$$

$$\begin{array}{r} -225 \\ \hline \end{array}$$

$$\frac{11x}{11} = \frac{55}{11}$$

$$\boxed{x = 5 \text{ mph}}$$

- 10) Jose left the airport and traveled toward the mountains. Kayla left 2.1 hours later traveling 35 mph faster in an effort to catch up to him. After 1.2 hours Kayla finally caught up. Find Jose's average speed.



$$3.3x = 1.2(x+35)$$

$$3.3x = 1.2x + 42$$

$$\begin{array}{r} -1.2 \quad -1.2 \\ \hline \end{array}$$

$$\frac{2.1x}{2.1} = \frac{42}{2.1}$$

$$\boxed{x = 20 \text{ mph}}$$