

REVIEW: Rates

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P4

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ratio: a comparison between two numbers with the same units

rate: a comparison of two numbers measured in different units

e.g. km/hr or \$/kg

We can use proportions to solve problems involving rates.

Make sure you include units with your answer.

Examples

For every 100 km of highway driving, Mr. Galloway's SUV uses 6.3 litres of fuel. The rate of fuel consumption is:

6.3L per 100 km

or 6.3L/100km

If you earn \$150.00 in 12 hours how much will you earn if you work 40 hours?

$$\frac{\$150}{12 \text{ hr}} = \frac{x}{40 \text{ hr}}$$

$$x = \frac{150 \times 40}{12}$$
$$= \$500$$

$$\frac{350 \text{ km}}{50 \text{ L}} = \frac{1800 \text{ km}}{x}$$

Scott filled up his gas tank with 50 L of fuel after driving for 350 km.

- How many liters of fuel will Scott need to travel from Prince George to Winnipeg, a distance of 1800 km?

$$\frac{50 \text{ L}}{350 \text{ km}} = \frac{x}{1800 \text{ km}}$$

$$x = \frac{50 \times 1800}{350} \\ = \boxed{257.14 \text{ L}}$$

- If the price of gas is \$1.30/L, how much will it cost to buy fuel on his trip to Winnipeg?

$$\frac{\$1.30}{1 \text{ L}} = \frac{x}{257.14 \text{ L}}$$

$$x = \frac{1.30 \times 257.14}{1} \\ = \boxed{\$334.28}$$

You Try

Bill can type 120 words in three minutes.

- How many words can he type in 1 minute?

$$\frac{120 \text{ words}}{3 \text{ min}} = \frac{x}{1 \text{ min}}$$

$$x = \boxed{40 \text{ words}}$$

- How many words can he type in 15 minutes?

$$\frac{120 \text{ words}}{3 \text{ min}} = \frac{x}{15 \text{ min}}$$

$$x = \boxed{600 \text{ words}}$$

- How long would it take him to type a 6000 word report?

$$\frac{120 \text{ words}}{3 \text{ min}} = \frac{6000 \text{ words}}{x}$$

$$x = \boxed{150 \text{ min}}$$

2 hours 30 min
2.5 hours

Dylan drove from Prince George to Williams Lake, a distance of 240 km, in three hours.

- What is his speed in kilometers per hour? (unit rate)

$$\frac{240 \text{ km}}{3 \text{ hr}} = \frac{x}{1 \text{ hr}} \quad x = \frac{240 \times 1}{3} = \boxed{80 \text{ km/hr}}$$

- At the same speed, how long would it take him to drive from Prince George to Calgary, a distance of 1000 km?

$$\frac{240 \text{ km}}{3 \text{ hr}} = \frac{1000 \text{ km}}{x} \quad x = \frac{3 \times 1000}{240} = \boxed{12.5 \text{ hours}}$$

- At the same speed, how far will he get if he drives for 8 hours and 15 minutes?

$$\frac{240 \text{ km}}{3 \text{ hr}} = \frac{x}{8.25 \text{ hr.}} \quad x = \frac{240 \times 8.25}{3} = \boxed{660 \text{ km}}$$

= 8.25 hr.

$$\begin{aligned} 60 \text{ min} &= 15 \text{ min} \\ 1 \text{ hr} &= x \\ x &= \frac{1 \times 15}{60} = 0.25 \text{ hr} \end{aligned}$$

John works four hours a day at a warehouse and makes \$64.

- How much did he earn in one hour?

$$\frac{\$64}{4 \text{ hr}} = \frac{x}{1 \text{ hr}} \quad x = \frac{64 \times 1}{4} = \boxed{\$16}$$

- How long will it take him to earn \$200?

$$\frac{\$64}{4 \text{ hr}} = \frac{\$200}{x} \quad x = \frac{4 \times 200}{64} = \boxed{12.5 \text{ hours}}$$

Assignment: Worksheet "Rates"