

Main Concept

Working with Unit Rates

Using a Rate

I make 9 dollars per hour. How much money will I make in 18 hours?

rate

quantity

Rate: 9 dollars = 1 hour

Write the rate as a fraction to cancel the units.

$$\frac{18 \cancel{\text{ hours}}}{1} \cdot \frac{9 \text{ dollars}}{1 \cancel{\text{ hour}}} = \frac{162 \text{ dollars}}{1} = 162 \text{ dollars}$$

Check: Does my result actually answer the question?

Using a Rate

If I can read 24 pages per hour, how many pages can I read in 6 hours?

rate
quantity

Rate: 24 pages = 1 hour

Write the rate as a fraction to cancel the units.

$$\frac{\cancel{6 \text{ hours}}}{1} \cdot \frac{24 \text{ pages}}{\cancel{1 \text{ hour}}} = \frac{144 \text{ pages}}{1} = 144 \text{ pages}$$

Check: Does my result actually answer the question?

Using a Rate

How long will it take me to walk 125 feet if I walk at a speed of 3 feet per second?

quantity

rate

Rate: 3 feet = 1 second

Write the rate as a fraction to cancel the units.

$$\frac{125 \cancel{\text{ feet}}}{1} \cdot \frac{1 \text{ second}}{3 \cancel{\text{ feet}}} = \frac{125 \text{ seconds}}{3} = 41\frac{2}{3} \text{ seconds}$$
$$3 \overline{)125} \quad 41\frac{2}{3}$$

Check: Does my result actually answer the question?

Using a Rate

If I type 35 words per minute, how long will it take me to type a 735 word essay?

quantity

rate

Rate: 35 words = 1 minute

Write the rate as a fraction to cancel the units.

$$\frac{735 \cancel{\text{ words}}}{1} \cdot \frac{1 \text{ minute}}{35 \cancel{\text{ words}}} = \frac{735 \text{ minutes}}{35} = 21 \text{ minutes}$$

$$\begin{array}{r} 21 \\ 35 \overline{)735} \end{array}$$

Check: Does my result actually answer the question?

Using a Rate

If I send 42 texts in 3 hours, how many will I send in 8 hours (if I don't get my phone taken away)?

rate
quantity

Rate: 42 texts = 3 hours

Write the rate as a fraction to cancel the units.

$$\frac{8 \cancel{\text{ hours}}}{1} \cdot \frac{42 \text{ texts}}{3 \cancel{\text{ hours}}} = \frac{336 \text{ texts}}{3} = 112 \text{ texts}$$
$$\begin{array}{r} 112 \\ 3 \overline{)336} \end{array}$$

Check: Does my result actually answer the question?