

# Understanding Proportions

Do the ratios  $\frac{20 \text{ mi}}{5 \text{ days}}$  and  $\frac{40 \text{ mi}}{10 \text{ days}}$  form a proportion?

First, check that the units are the same across the top and bottom.

$$\frac{20 \text{ mi}}{5 \text{ days}} \stackrel{?}{=} \frac{40 \text{ mi}}{10 \text{ days}}$$

The units are the same.

Then look at the cross products.

$$\frac{20}{5} = \frac{40}{10} \quad \text{Multiply the denominator of one fraction by the numerator of the other fraction.}$$

$$\frac{20}{5} \times \frac{40}{10} \quad 20 \times 10 = 40 \times 5$$

$$200 = 200$$

The cross products are equal.

Since the units are the same and the cross products are equal, the ratios form a proportion.

Decide if the ratios form a proportion.

1.  $\frac{5 \text{ min}}{30 \text{ ft}}, \frac{20 \text{ min}}{120 \text{ ft}}$  \_\_\_\_\_

2.  $\frac{20 \text{ mi}}{2 \text{ gal}}, \frac{25 \text{ mi}}{2.5 \text{ gal}}$  \_\_\_\_\_

3. \$10.00: 2 hr; \$400.00: 40 hr \_\_\_\_\_

4.  $\frac{20 \text{ ft}}{1 \text{ sec}}, \frac{80 \text{ ft}}{4 \text{ sec}}$  \_\_\_\_\_

5.  $\frac{64 \text{ mi}}{4 \text{ sec}}, \frac{64 \text{ sec}}{4 \text{ mi}}$  \_\_\_\_\_

6.  $\frac{22 \text{ gal}}{5 \text{ c}}, \frac{44 \text{ gal}}{15 \text{ c}}$  \_\_\_\_\_

7. Reasoning How can you tell that  $\frac{\$10.25}{5 \text{ hr}}$  and  $\frac{11 \text{ gal}}{10 \text{ hr}}$  do not form a proportion?

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# Understanding Proportions

Decide if the ratios form a proportion.

1.  $\frac{12 \text{ min.}}{30 \text{ min.}}, \frac{36 \text{ ft.}}{90 \text{ min.}}$  \_\_\_\_\_
2.  $\frac{15 \text{ mi.}}{1 \text{ gal.}}, \frac{25 \text{ mi.}}{1 \text{ gal.}}$  \_\_\_\_\_
3. \$5.00:1 hr; \$200.00:40 hr \_\_\_\_\_
4.  $\frac{200 \text{ ft.}}{1 \text{ sec.}}, \frac{4,000 \text{ ft.}}{20 \text{ sec.}}$  \_\_\_\_\_
5.  $\frac{32 \text{ gal.}}{2 \text{ sec.}}, \frac{64 \text{ sec.}}{4 \text{ gal.}}$  \_\_\_\_\_
6. \$18.75:10 lb; \$56.25: 30 lb \_\_\_\_\_
7. **Number Sense** Explain how you could write  $\frac{12 \text{ mi.}}{30 \text{ min.}}$  and  $\frac{24 \text{ mi.}}{1 \text{ hr}}$  as a proportion.  
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8. **Algebra** What value of x would form a proportion?

$$\frac{32 \text{ mi.}}{x} = \frac{160 \text{ mi.}}{50 \text{ min}}$$

9. Which two fruit stands' apple to orange ratios are equal?  
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Fruit Stand	Apples	Oranges
Kendra	32	4
Chloe	10	25
Hillary	7	21
Bethany	16	2

10. Write a ratio equal to Chloe's apple to orange ratio.  
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## Test Prep

11. Which of the following ratios forms a proportion with  $\frac{45 \text{ mi.}}{1 \text{ hr}}$ ?  
 A.  $\frac{21 \text{ mi.}}{30 \text{ sec}}$       B.  $\frac{4.5 \text{ mi.}}{1 \text{ min}}$       C.  $\frac{450 \text{ mi.}}{10 \text{ hr}}$       D.  $\frac{45 \text{ hr}}{1 \text{ mi}}$
12. **Writing in Math** Write a ratio that is proportional with  $\frac{5 \text{ mi.}}{20 \text{ min.}}$ . Explain how you found this ratio.  
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