

Name: Key

Algebra 1

Dimensional Analysis Practice

Use dimensional analysis to convert each rate. Show all of your work and draw a line through the units that cancel. Round your answer to the nearest hundredth.

1. Convert 13 feet per second to miles per hour.

$$\frac{13 \cancel{\text{ft}}}{1 \cancel{\text{sec}}} \times \frac{1 \cancel{\text{mi}}}{5280 \cancel{\text{ft}}} \times \frac{60 \cancel{\text{sec}}}{1 \cancel{\text{min}}} \times \frac{60 \cancel{\text{min}}}{1 \cancel{\text{hr}}} = 8.86 \text{ mi/hr}$$

2. Convert 40 miles per hour to feet per second.

$$\frac{40 \cancel{\text{mi}}}{1 \cancel{\text{hr}}} \times \frac{5280 \cancel{\text{ft}}}{1 \cancel{\text{mi}}} \times \frac{1 \cancel{\text{hr}}}{60 \cancel{\text{min}}} \times \frac{1 \cancel{\text{min}}}{60 \cancel{\text{sec}}} = 58.67 \text{ ft/sec.}$$

3. Convert 150 yards per minute to feet per day.

$$\frac{150 \cancel{\text{yd}}}{1 \cancel{\text{min}}} \times \frac{60 \cancel{\text{min}}}{1 \cancel{\text{hr}}} \times \frac{24 \cancel{\text{hr}}}{1 \cancel{\text{day}}} \times \frac{3 \cancel{\text{ft}}}{1 \cancel{\text{yd}}} = 648,000 \text{ ft/day}$$

4. Convert 3.82 meters per second to kilometers per hour.

$$\frac{3.82 \cancel{\text{m}}}{1 \cancel{\text{sec}}} \times \frac{60 \cancel{\text{sec}}}{1 \cancel{\text{min}}} \times \frac{60 \cancel{\text{min}}}{1 \cancel{\text{hr}}} \times \frac{1 \cancel{\text{km}}}{1000 \cancel{\text{m}}} = 13.75 \text{ km/hr}$$

5. Convert 15 miles per hour to inches per second.

$$\frac{15 \cancel{\text{mi}}}{1 \cancel{\text{hr}}} \times \frac{1 \cancel{\text{hr}}}{60 \cancel{\text{min}}} \times \frac{1 \cancel{\text{min}}}{60 \cancel{\text{sec}}} \times \frac{5280 \cancel{\text{ft}}}{1 \cancel{\text{mi}}} \times \frac{12 \cancel{\text{in}}}{1 \cancel{\text{ft}}} = 264 \text{ in/sec}$$

6. Falcons can dive at speeds of up to 318 feet per second. Convert this speed to miles per hour.

$$\frac{318 \cancel{\text{ft}}}{1 \cancel{\text{sec}}} \times \frac{60 \cancel{\text{sec}}}{1 \cancel{\text{min}}} \times \frac{60 \cancel{\text{min}}}{1 \cancel{\text{hr}}} \times \frac{1 \cancel{\text{mi}}}{5280 \cancel{\text{ft}}} = 216.82 \text{ mi/hr}$$

7. A cyclist travels 56 miles in 4 hours. What is the cyclist's speed in feet per minute?

$$\frac{56 \cancel{\text{mi}}}{4 \cancel{\text{hr}}} \times \frac{1 \cancel{\text{hr}}}{60 \cancel{\text{min}}} \times \frac{5280 \cancel{\text{ft}}}{1 \cancel{\text{mi}}} = 1232 \text{ ft/min.}$$