

UNIT ANALYSIS When you use operations in real-life problems, you should use *unit analysis* to check that the units in your calculations make sense.

EXAMPLE 5 Use unit analysis with operations

- You work 4 hours and earn \$36. What is your earning rate?
- You travel for 2.5 hours at 50 miles per hour. How far do you go?
- You drive 45 miles per hour. What is your speed in feet per second?

Solution

a. $\frac{36 \text{ dollars}}{4 \text{ hours}} = 9 \text{ dollars per hour}$

b. $(2.5 \text{ hours}) \left(\frac{50 \text{ miles}}{1 \text{ hour}} \right) = 125 \text{ miles}$

c. $\left(\frac{45 \text{ miles}}{1 \text{ hour}} \right) \left(\frac{1 \text{ hour}}{60 \text{ minutes}} \right) \left(\frac{1 \text{ minute}}{60 \text{ seconds}} \right) \left(\frac{5280 \text{ feet}}{1 \text{ mile}} \right) = 66 \text{ feet per second}$

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EXAMPLE 6 Use unit analysis with conversions

DRIVING DISTANCE The distance from Montpelier, Vermont, to Montreal, Canada, is about 132 miles. The distance from Montreal to Quebec City is about 253 kilometers.

- Convert the distance from Montpelier to Montreal to kilometers.
- Convert the distance from Montreal to Quebec City to miles.

Solution

a. $132 \text{ miles} \cdot \frac{1.61 \text{ kilometers}}{1 \text{ mile}} \approx 213 \text{ kilometers}$

b. $253 \text{ kilometers} \cdot \frac{1 \text{ mile}}{1.61 \text{ kilometers}} \approx 157 \text{ miles}$



GUIDED PRACTICE for Examples 5 and 6

Solve the problem. Use unit analysis to check your work.

- You work 6 hours and earn \$69. What is your earning rate?
- How long does it take to travel 180 miles at 40 miles per hour?
- You drive 60 kilometers per hour. What is your speed in miles per hour?

Perform the indicated conversion.

- 150 yards to feet
- 4 gallons to pints
- 16 years to seconds

REVIEW MEASURES

For help with converting units, see the Table of Measures on p. 1025.