

Section 3.5 Special Solution Sets

Equations with Special Solution Sets

1. Solve each equation.

a. $3x + 7 - x = 2x - 11$

b. $2x + 5 + x = 3(x - 1) + 8$

c. $5x + 1 = 6x + 1$

An equation or inequality is inconsistent if it is not true for any real number. In this case we write

- No solution
- the empty set: \emptyset , or
- empty brackets: $\{ \}$

An equation or inequality is an identity if it is true for all real numbers. In this case we write

- All real numbers
- \mathbb{R}
- $\{x \mid x \text{ is a real number}\}$

2. Write the solution for each equation or inequality.

a. $x = x$

b. $x > x$

c. $0 = 4$

d. $2 \leq 4$

e. $2x = 2x + 1$

f. $x \geq x$

g. $2x - 7 > 2(x - 5) + 3$

h. $-2(x + 3) = 4x - 6(x + 1)$

3. Emil and Julia are saving money in their accounts. Emil starts with \$100 and saves \$60 per month. Julia starts with \$200 and saves \$60 per month. To determine when they will have the same amount in savings, let x be the number of months they save and solve the equation:

$$100 + 60x = 200 + 60x$$

Section 3.4 Ratios and Proportions

A rate or ratio compares two quantities using division.

A proportion states that two rates or ratios are equal.

4. Solve the following proportions. Check each solution and write the solution set.

a. $\frac{x+2}{5} = \frac{3}{4}$

b. $\frac{10}{y-1} = \frac{16}{y+2}$

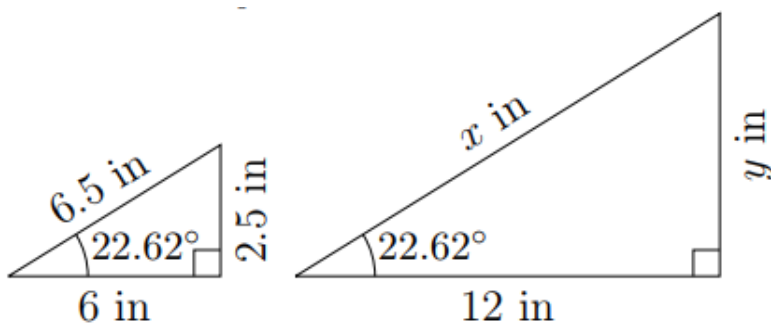
c. $\frac{x+3}{4} = \frac{7}{12}$

d. $\frac{z}{9} = \frac{z-1}{6}$

5. A car is driving 60 mph. Set up and solve a proportion to find out how long will it take the car to travel 132 miles? Remember to define your variable.

Similar triangles have the same angles and their sides are proportional.

6. Write and solve proportions for the similar triangles to find x and y .

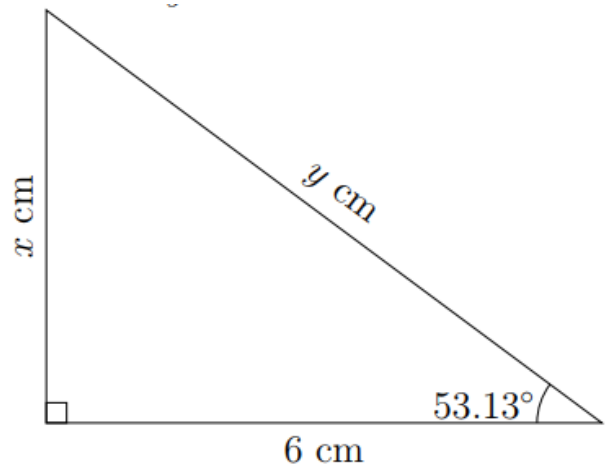
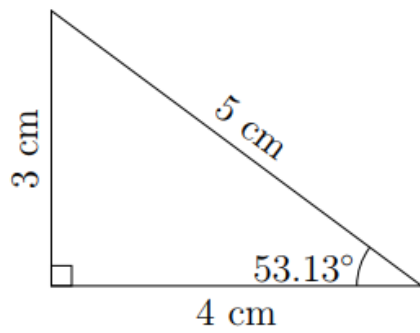


7. An 8-ounce can of soda contains 36 milligrams of caffeine. How much caffeine is contained in a 20-ounce bottle?

More Practice

8. The annual property taxes for a house assessed at \$250,000 were \$2,463. Find the property taxes for a house assessed at \$325,000.

9. Write and solve proportions to find the value of x and y .



10. Solve each equation below and state the solution set.

a. $5(t+3) \geq 2(t-3) + 3(t-7)$

b. $5(2y-1) - 5 = 12y - 2(y+3)$