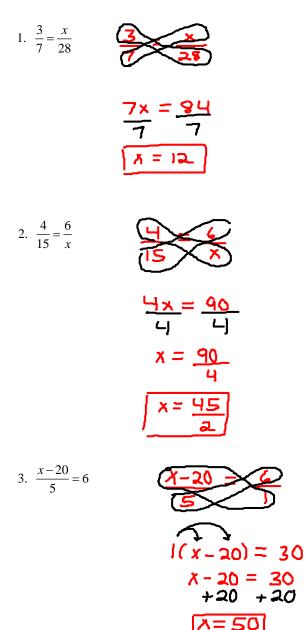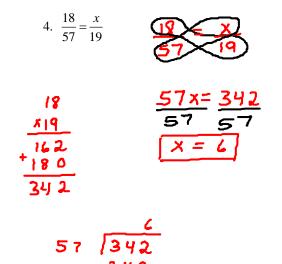# Proportions

Proportions are two ratios that are equal to each other.

$$\frac{1}{2} = \frac{3}{6} = \frac{8}{16} = \frac{12}{24}$$

Directions: Solve each proportion.

1. $\dfrac{3}{7} = \dfrac{x}{28}$

$$\frac{7x}{7} = \frac{84}{7}$$

$$x = 12$$

2. $\dfrac{4}{15} = \dfrac{6}{x}$

$$\frac{4x}{4} = \frac{90}{4}$$

$$x = \frac{90}{4}$$

$$x = \frac{45}{2}$$

3. $\dfrac{x-20}{5} = 6$

$$1(x-20) = 30$$
$$x - 20 = 30$$
$$+20 \quad +20$$

$$x = 50$$

4. $\dfrac{18}{57} = \dfrac{x}{19}$

OR $\dfrac{18}{57} = \dfrac{x}{19}$

$$\begin{array}{r} 18 \\ \times 19 \\ \hline 162 \\ + 180 \\ \hline 342 \end{array}$$

$$\dfrac{57x}{57} = \dfrac{342}{57}$$

$$\boxed{x = 6}$$

$57 \div 3 = 19$

$18 \div 3 = 6$

$$\boxed{x = 6}$$

$$57\overline{)342}\quad 6$$
$$\underline{-342}$$
$$0$$

5. $\dfrac{6}{3-x} = \dfrac{2}{7}$

$2(3-x) = 42$

$6 - 2x = 42$

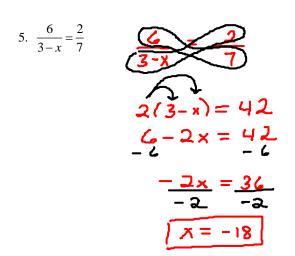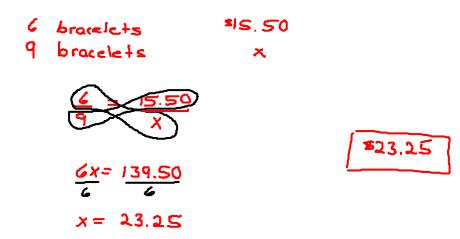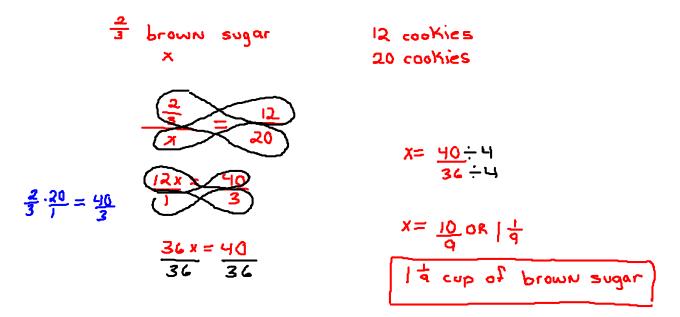$-6 \qquad\quad -6$

$\dfrac{-2x}{-2} = \dfrac{36}{-2}$

$$\boxed{x = -18}$$

6. If six bracelets cost $15.50, what is the cost of 9 bracelets?

6 bracelets $15.50

9 bracelets x

$\dfrac{6}{9} = \dfrac{15.50}{x}$

$\dfrac{6x}{6} = \dfrac{139.50}{6}$

$x = 23.25$

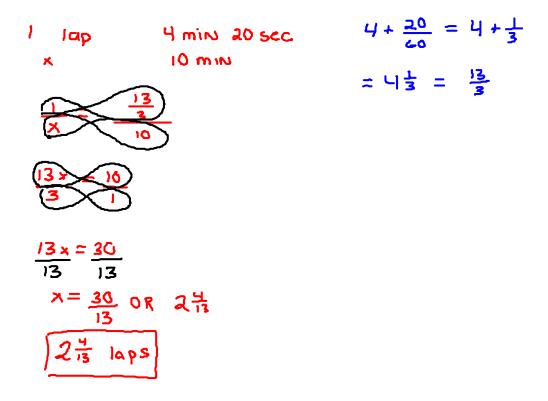$$\boxed{\$23.25}$$

7. Faith is making chocolate chip cookies. The recipe requires $\frac{2}{3}$ cup of brown sugar to make 12 cookies.

How much brown sugar will she need if she wants to make 20 cookies?

$\frac{2}{3}$ brown sugar
x

12 cookies
20 cookies

$$\frac{\frac{2}{3}}{x} = \frac{12}{20}$$

$$\frac{2}{3} \cdot \frac{20}{1} = \frac{40}{3}$$

$12x = 40$
$1 \quad 3$

$x = \frac{40 \div 4}{36 \div 4}$

$\frac{36x}{36} = \frac{40}{36}$

$x = \frac{10}{9}$ OR $1\frac{1}{9}$

$1\frac{1}{9}$ cup of brown sugar

8. A map has a scale of 1:40 (1 inch = 40 feet). If the distance between two points on a map is $3\frac{1}{2}$ inches, what is the actual distance?

1 inch   40 feet
$3\frac{1}{2}$ inches x

$\frac{1}{3\frac{1}{2}} = \frac{40}{x}$

$\frac{1}{\frac{7}{2}} = \frac{40}{x}$

$\frac{7}{2} \cdot \frac{\overset{20}{40}}{1} = 140$

$x = 140$

140 feet

9. Jennifer can run one lap around the track in 4 minutes and 20 seconds. How many laps can she run in 10 minutes?

1 lap   4 min 20 sec $4 + \frac{20}{60} = 4 + \frac{1}{3}$

x   10 min $\approx 4\frac{1}{3} = \frac{13}{3}$

$$\frac{1}{x} = \frac{\frac{13}{3}}{10}$$

$$\frac{13x}{3} = \frac{10}{1}$$

$$13x = 30$$

$$\frac{13x}{13} = \frac{30}{13}$$

$$x = \frac{30}{13} \text{ OR } 2\frac{4}{13}$$

$$\boxed{2\frac{4}{13} \text{ laps}}$$

10. Maria earns $68 for 8 hours of work. How much does she earn for 30 hours of work at the same rate?

$68   8 hours

x   30 hours

$$\frac{68}{x} = \frac{8}{30}$$

$$\frac{8x}{8} = \frac{2040}{8}$$

$$x = 255$$

$$\boxed{\$255}$$