

**Section 1.1 Things to Know:**

- Translating between words and expressions
- Evaluating expressions

**Section 1.2 Things to Know**

- Solving one-step equations using addition and subtraction
- Writing and solving one-step equations using addition and subtraction from word problems.

**Section 1.3 Things to Know**

- Solving one-step equations using multiplication and division
- Writing and solving one-step equations using multiplication and division from word problems.

**Section 1.4 Things to Know:**

- Solve two-step equations using inverse operations
  - Use addition / subtraction to isolate the term with the variable
  - Use multiplication / division to get the coefficient of the variable = 1
  - Simplify each side FIRST by combining like terms or distributing, and then solve
- Express word problems as two-step algebraic equations and solve them.

**Section 1.5 Things to Know**

- Solve equations in one variable that contain variable terms on both sides of the equation.
  - Bring variables on one side
  - Bring constants to the other side
  - Solve
- Express word problems as algebraic equations that contain variables on both sides of the equation and solve them.

**Section 1.6 Things to Know**

- Write ratios in three different ways
- Solve proportions by using cross-multiplication
- Write and solve proportions from word problems.

Write the expression that best represents the situation.

1. A principal spent \$1560 on  $c$  calculators for her school. Write the expression that represents the cost of one calculator.

$$1560c$$

2. The width of a rectangle is 6 units less than its length  $x$ . Write the expression for the width of the rectangle.

$$x - 6$$

Write a verbal expression for the following numerical expressions in two ways.

3.  $n - 8$

$n$  minus 8  
 $n$  subtracted by 8  
difference of  $n$  and 8  
8 less than  $n$

4.  $-\frac{4}{x}$

-4 divided by  $x$   
the quotient of -4 and  $x$

Write the algebraic expression for the following verbal expressions.

5. The product of -2 and  $x$ .

$$-2x$$

6. Two times the difference of  $x$  and 5

$$2(x - 5)$$

Evaluate each expression for  $a = -6$ ,  $b = -1$ , and  $c = 3$

7.  $\frac{a}{c}$   $\frac{-6}{3} = \boxed{-2}$

10.  $-\frac{b}{c}$   $-\frac{-1}{3} = \boxed{\frac{1}{3}}$

8.  $a - b$   $-6 - (-1)$   
 $-6 + 1 = \boxed{-5}$

11.  $bc - a$

$$(-1)(3) - (-6)$$
$$-3 + 6 = \boxed{3}$$

9.  $b + c$   $-1 + 3 = \boxed{2}$

12.  $-\frac{1}{2}abc$

$-\frac{1}{2}(-6)(-1)(3) = \boxed{-9}$

13. Ashley went out to dinner with some friends. The total bill was \$72.

a. Write an expression for the amount of money that each person spent.

$x = \begin{matrix} \# \text{ of people} \\ \text{out to dinner} \end{matrix} \quad \frac{72}{x}$

b. Find the amount of money that each person spent if Ashley had 7 friends with her.

$\frac{7 \text{ friends} + 1 \text{ Ashley}}{8 \text{ total}}$

$\frac{72}{x} \quad \frac{72}{8} = 9$

$\$9 \text{ each}$

Solve for x. Show all work to receive full credit. If there is no solution, write no solution. If the solution is all real numbers, write all real numbers.

1.  $\frac{-4}{5} \cdot -\frac{5}{4}x = -15 \cdot \frac{-4}{5}$   
 $x = \boxed{12}$

4.  $-\frac{x}{3} = -4 \cdot -3$   
 $x = \boxed{12}$

2.  $-2x + 6 = -16$   
 $\frac{-2x}{-2} = \frac{-22}{-2}$   
 $x = \boxed{11}$

5.  $\frac{6}{5}x - \frac{5}{3} = \frac{1}{3}$   
 $\frac{6}{5}x = \frac{6}{3}$   
 $\frac{5}{6} \cdot \frac{6}{5}x = 2 \cdot \frac{5}{6}$   
 $x = \boxed{\frac{5}{3}}$

3.  $2 - 2(3x + 2) = -6x - 2$   
 $2 - 6x - 4 = -6x - 2$   
 $-6x - 2 = -6x - 2$   
 $+6x \quad +6x$   
 $-2 = -2$   
TRUE  $\rightarrow$   $\boxed{TR}$   
All real numbers

6.  $3(x - 5) + 1 = 2x - 3$   
 $3x - 15 + 1 = 2x - 3$   
 $3x - 14 = 2x - 3$   
 $-2x \quad -2x$   
 $x - 14 = -3$   
 $+14 \quad +14$   
 $x = \boxed{11}$



For each word problem, you must write an equation and solve it. Be sure to answer the question (WITH UNITS when necessary). Show all work as done in class and round to the nearest TENTH if necessary)

15. Allen made \$156 working with his dad. He had to pay \$5/week to his parents, because he was renting movies every Friday. When he is finished paying his parents back, he still has \$101 left. How many movies did he rent?

$$\begin{array}{r} 156 - 5x = 101 \\ -156 \quad -156 \\ \hline -5x = -55 \\ \frac{-5x}{-5} = \frac{-55}{-5} \\ \boxed{x = 11} \end{array}$$

$x = \#$  of movies

11 movies

16. Mrs. Grant is trying to decide between two cell phone companies. The first company charges \$20 per month plus \$2 per gigabyte of data used. The second company charges no monthly fee but \$4 per gigabyte used. After how many gigabytes of data will the two companies charge the same amount?

1<sup>st</sup> company = 2<sup>nd</sup> company

$$\begin{array}{r} 20 + 2x = 4x \\ -2x \quad -2x \\ \hline 20 = 2x \\ \frac{20}{2} = \frac{2x}{2} \\ \boxed{10 = x} \end{array}$$

$x = \#$  of gigabytes

10 gigabytes

For each word problem, be sure to answer the question (WITH UNITS when necessary). Show all work as done in class and round to the nearest TENTH if necessary)

17. A pizza guy chef can bake 15 pies in 4 hours. About how many pies can he bake in 1 hour?

pies  
hour

$$\frac{15}{4} = \frac{x}{1}$$
$$\frac{4x}{4} = \frac{15}{4}$$
$$x = 3.75$$

3.8 pies

18. If it takes 5 cups of flour to make 6 dozen cookies, how many cups of flour would be needed to make 150 cookies?

$\frac{\text{flour}}{\text{cookies}}$

$$\frac{5}{72} = \frac{x}{150}$$

$$\frac{72x}{72} = \frac{750}{72}$$

$$x = 10.41$$

10.4 cups of flour

19. The field hockey team sold 54 cookies, 36 brownies, and 42 cupcakes at their bake sale. Write the following ratios in three different ways:

a. Cookies to cupcakes

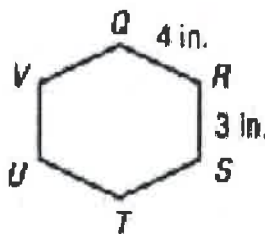
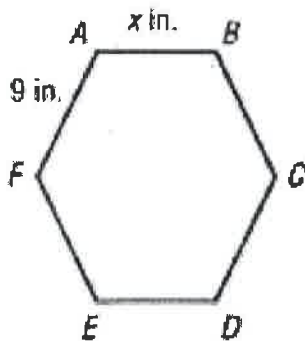
$$\frac{54}{42} = \frac{9}{7}$$

b. brownies to total

$$\frac{36}{132} = \frac{3}{11}$$

$$54 + 36 + 42$$

$ABCDEF \sim RSTUVQ$ . Find  $x$ .



20.

$\frac{\text{large}}{\text{small}}$

$\frac{AB}{RS}$

$$\frac{x}{3} = \frac{9}{4} \quad \frac{AF}{RQ}$$

$$\frac{4x}{4} = \frac{27}{4}$$

$$x = \frac{27}{4} \text{ in}$$

6.75 inches