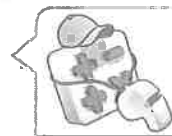


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## Find the Square of a Number

**EXAMPLE** Find the square of  $\frac{2}{3}$ .

$$\begin{aligned}\frac{2}{3} \times \frac{2}{3} &= \frac{2 \times 2}{3 \times 3} \\ &= \frac{4}{9}\end{aligned}$$

Multiply the number by itself.

Simplify.

Find the square of each number.

1. 7 \_\_\_\_\_ 2. 21 \_\_\_\_\_ 3. -3 \_\_\_\_\_ 4.  $\frac{4}{5}$  \_\_\_\_\_

5. 2.7 \_\_\_\_\_ 6.  $-\frac{1}{4}$  \_\_\_\_\_ 7. -5.7 \_\_\_\_\_ 8.  $1\frac{2}{5}$  \_\_\_\_\_

## Exponents

**EXAMPLE**  $5^3 = 5 \times 5 \times 5$  Use the base, 5, as a factor 3 times.

$$= 25 \times 5$$

Multiply from left to right.

$$= 125$$

Simplify each exponential expression.

9.  $9^2$  \_\_\_\_\_ 10.  $2^4$  \_\_\_\_\_ 11.  $\left(\frac{1}{3}\right)^2$  \_\_\_\_\_ 12.  $(-7)^2$  \_\_\_\_\_

13.  $4^3$  \_\_\_\_\_ 14.  $(-1)^5$  \_\_\_\_\_ 15.  $4.5^2$  \_\_\_\_\_ 16.  $10^5$  \_\_\_\_\_

## Write a Mixed Number as an Improper Fraction

**EXAMPLE**  $2\frac{2}{5} = 2 + \frac{2}{5}$

Write the mixed number as a sum of a whole number and a fraction.

$$= \frac{10}{5} + \frac{2}{5}$$

Write the whole number as an equivalent fraction with the same denominator as the fraction in the mixed number.

$$= \frac{12}{5}$$

Add the numerators.

Write each mixed number as an improper fraction.

17.  $3\frac{1}{3}$  \_\_\_\_\_ 18.  $1\frac{5}{8}$  \_\_\_\_\_ 19.  $2\frac{3}{7}$  \_\_\_\_\_ 20.  $5\frac{5}{6}$  \_\_\_\_\_

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## Exponents

**EXAMPLE**  $10^4 = 10 \times 10 \times 10 \times 10$   
 $= 10,000$

Write the exponential expression as a product. Simplify.

Write each exponential expression as a decimal.

1.  $10^2$  \_\_\_\_\_ 2.  $10^3$  \_\_\_\_\_ 3.  $10^5$  \_\_\_\_\_ 4.  $10^7$  \_\_\_\_\_

## Multiply and Divide by Powers of 10

**EXAMPLE**  $0.0478 \times 10^5 = 0.0478 \times 100,000$   
 $= 4,780$

Identify the number of zeros in the power of 10. When multiplying, move the decimal point to the right the same number of places as the number of zeros.

$37.9 \div 10^4 = 37.9 \div 10,000$   
 $= 0.00379$

Identify the number of zeros in the power of 10. When dividing, move the decimal point to the left the same number of places as the number of zeros.

Find each product or quotient.

5.  $45.3 \times 10^3$

\_\_\_\_\_

6.  $7.08 \div 10^2$

\_\_\_\_\_

7.  $0.00235 \times 10^6$

\_\_\_\_\_

8.  $3,600 \div 10^4$

\_\_\_\_\_

9.  $0.5 \times 10^2$

\_\_\_\_\_

10.  $67.7 \div 10^5$

\_\_\_\_\_

11.  $0.0057 \times 10^4$

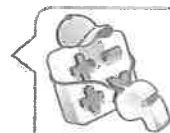
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12.  $195 \div 10^6$

\_\_\_\_\_

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## Write Fractions as Decimals

**EXAMPLE**  $\frac{1.7}{2.5} = ?$

Multiply the numerator and the denominator by a power of 10 so that the denominator is a whole number.

$$\frac{1.7 \times 10}{2.5 \times 10} = \frac{17}{25}$$

Write the fraction as a division problem.

Write a decimal point and zeros in the dividend.

Place a decimal point in the quotient.

Divide as with whole numbers.

$$\begin{array}{r} 0.68 \\ 25 \overline{)17.00} \\ \underline{-150} \phantom{0} \\ 200 \\ \underline{-200} \\ 0 \end{array}$$

Write each fraction as a decimal.

1.  $\frac{3}{8}$  \_\_\_\_\_

2.  $\frac{0.3}{0.4}$  \_\_\_\_\_

3.  $\frac{0.13}{0.2}$  \_\_\_\_\_

4.  $\frac{0.39}{0.75}$  \_\_\_\_\_

5.  $\frac{4}{5}$  \_\_\_\_\_

6.  $\frac{0.1}{2}$  \_\_\_\_\_

7.  $\frac{3.5}{14}$  \_\_\_\_\_

8.  $\frac{7}{14}$  \_\_\_\_\_

9.  $\frac{0.3}{10}$  \_\_\_\_\_

## Solve Proportions

**EXAMPLE**  $\frac{5}{7} = \frac{x}{14}$

$$\frac{5 \times 2}{7 \times 2} = \frac{x}{14}$$

$$\frac{10}{14} = \frac{x}{14}$$

$$x = 10$$

$7 \times 2 = 14$ , so multiply the numerator and denominator by 2.

$$5 \times 2 = 10$$

Solve each proportion for  $x$ .

10.  $\frac{20}{18} = \frac{10}{x}$  \_\_\_\_\_

11.  $\frac{x}{12} = \frac{30}{72}$  \_\_\_\_\_

12.  $\frac{x}{4} = \frac{4}{16}$  \_\_\_\_\_

13.  $\frac{11}{x} = \frac{132}{120}$  \_\_\_\_\_

14.  $\frac{36}{48} = \frac{x}{4}$  \_\_\_\_\_

15.  $\frac{x}{9} = \frac{21}{27}$  \_\_\_\_\_

16.  $\frac{24}{16} = \frac{x}{2}$  \_\_\_\_\_

17.  $\frac{30}{15} = \frac{6}{x}$  \_\_\_\_\_

18.  $\frac{3}{x} = \frac{18}{36}$  \_\_\_\_\_

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## Integer Operations

**EXAMPLE**  $-7 - (-4) = -7 + 4$   
 $|-7| - |4|$   
 $7 - 4, \text{ or } 3$   
 $= -3$

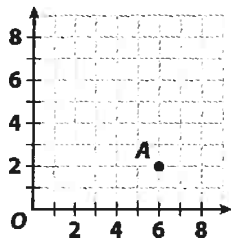
To subtract an integer, add its opposite.  
The signs are different, so find the difference of the absolute values.  
Use the sign of the number with the greater absolute value.

Find each difference.

- $3 - (-5)$  \_\_\_\_\_
- $-4 - 5$  \_\_\_\_\_
- $6 - 10$  \_\_\_\_\_
- $-5 - (-3)$  \_\_\_\_\_
- $8 - (-8)$  \_\_\_\_\_
- $9 - 5$  \_\_\_\_\_
- $-3 - 9$  \_\_\_\_\_
- $0 - (-6)$  \_\_\_\_\_
- $12 - (-9)$  \_\_\_\_\_
- $-6 - (-4)$  \_\_\_\_\_
- $-7 - 10$  \_\_\_\_\_
- $5 - 14$  \_\_\_\_\_

## Graph Ordered Pairs (First Quadrant)

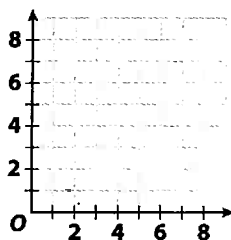
**EXAMPLE**



To graph a point at  $(6, 2)$ , start at the origin.  
Move 6 units right.  
Then move 2 units up.  
Graph point  $A(6, 2)$ .

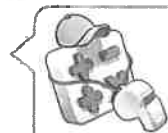
Graph each point on the coordinate grid.

- $B(0, 5)$
- $C(8, 0)$
- $D(5, 7)$
- $E(2, 3)$



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## Write Fractions as Decimals

**EXAMPLE**  $\frac{0.5}{0.8} = ?$  Multiply the numerator and the denominator by a power of 10 so that the denominator is a whole number.

$$\frac{0.5 \times 10}{0.8 \times 10} = \frac{5}{8}$$

$$\begin{array}{r} 0.625 \\ 8 \overline{)5.000} \\ \underline{-48} \phantom{00} \\ 20 \phantom{00} \\ \underline{-16} \phantom{00} \\ 40 \phantom{00} \\ \underline{-40} \phantom{00} \\ 0 \end{array}$$

Write the fraction as a division problem.  
Write a decimal point and zeros in the dividend.  
Place a decimal point in the quotient.  
Divide as with whole numbers.

Write each fraction as a decimal.

1.  $\frac{3}{8}$  \_\_\_\_\_      2.  $\frac{0.3}{0.4}$  \_\_\_\_\_      3.  $\frac{0.13}{0.2}$  \_\_\_\_\_      4.  $\frac{0.39}{0.75}$  \_\_\_\_\_

## Inverse Operations

**EXAMPLE**

$$\begin{aligned} 5n &= 20 \\ \frac{5n}{5} &= \frac{20}{5} \\ n &= 4 \end{aligned}$$

$n$  is multiplied by 5.  
To solve the equation, use the inverse operation, division.

$$\begin{aligned} k + 7 &= 9 \\ k + 7 - 7 &= 9 - 7 \\ k &= 2 \end{aligned}$$

7 is added to  $k$ .  
To solve the equation, use the inverse operation, subtraction.

Solve each equation using the inverse operation.

5.  $7p = 28$  \_\_\_\_\_      6.  $h - 13 = 5$  \_\_\_\_\_  
7.  $\frac{y}{3} = -6$  \_\_\_\_\_      8.  $b + 9 = 21$  \_\_\_\_\_  
9.  $c - 8 = -8$  \_\_\_\_\_      10.  $3n = -12$  \_\_\_\_\_  
11.  $-16 = m + 7$  \_\_\_\_\_      12.  $\frac{t}{-5} = -5$  \_\_\_\_\_

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## Evaluate Expressions

**EXAMPLE** Evaluate  $3x - 5$  for  $x = -2$ .

$$\begin{aligned} 3x - 5 &= 3(-2) - 5 \\ &= -6 - 5 \\ &= -11 \end{aligned}$$

Substitute the given value of  $x$  for  $x$ .

Multiply.

Subtract.

**Evaluate each expression for the given value of  $x$ .**

- $2x + 3$  for  $x = 3$  \_\_\_\_\_
- $-4x + 7$  for  $x = -1$  \_\_\_\_\_
- $1.5x - 2.5$  for  $x = 3$  \_\_\_\_\_
- $0.4x + 6.1$  for  $x = -5$  \_\_\_\_\_
- $\frac{2}{3}x - 12$  for  $x = 18$  \_\_\_\_\_
- $-\frac{5}{8}x + 10$  for  $x = -8$  \_\_\_\_\_

## Connect Words and Equations

**EXAMPLE** Erik's earnings equal 9 dollars per hour.

$e$  = earnings;  $h$  = hours  
multiplication

$$e = 9 \times h$$

Define the variables used in the situation.

Identify the operation involved.  
"Per" indicates multiplication.

Write the equation.

**Define the variables for each situation. Then write an equation.**

- Jana's age plus 5 equals her sister's age.  
\_\_\_\_\_
- Andrew's class has 3 more students than Lauren's class.  
\_\_\_\_\_
- The bank is 50 feet shorter than the firehouse.  
\_\_\_\_\_
- The pencils were divided into 6 groups of 2.  
\_\_\_\_\_

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## Find Common Denominators

**EXAMPLE** Find the LCD of 3, 5, and 10.

3: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30,...

5: 5, 10, 15, 20, 25, 30, 35,...

10: 10, 20, 30, 40, 50,...

List the multiples of each number.

Choose the least multiple the lists have in common.

$LCD(3, 5, 10) = 30$

**Find the LCD.**

1. 8, 12 \_\_\_\_\_ 2. 9, 12 \_\_\_\_\_ 3. 15, 20 \_\_\_\_\_ 4. 8, 10 \_\_\_\_\_

## Multiply Decimals by Powers of 10

**EXAMPLE**  $3.719 \times 100$

$$3.719 \times 100 = 371.9$$

Count the zeros in 100: 2 zeros

Move the decimal point 2 places to the right.

**Find the product.**

5.  $0.683 \times 100$       6.  $9.15 \times 1,000$       7.  $0.005 \times 100$       8.  $1,000 \times 1,000$
- \_\_\_\_\_

## Connect Words and Equations

**EXAMPLE** Two times a number decreased by 5 is  $-6$ .

Two times  $x$  decreased by 5 is  $-6$ .

$$2x - 5 \text{ is } -6$$

$$2x - 5 = -6$$

Represent the unknown with a variable.

Times means multiplication.

Decreased by means subtraction.

Place the equal sign.

**Write an algebraic equation for the sentence.**

9. The difference between three times a number and 7 is 14. \_\_\_\_\_
10. The quotient of five times a number and 7 is no more than 10. \_\_\_\_\_
11. 14 less than 3 times a number is 5 more than half of the number. \_\_\_\_\_

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## Simplify Algebraic Expressions

**EXAMPLE** Simplify  $5 - 4y + 2x - 6 + y$ .  
 $-4y + y + 2x - 6 + 5$   
 $-3y + 2x - 1$

Group like terms.  
 Combine like terms.

**Simplify.**

1.  $14x - 4x + 21$

\_\_\_\_\_

2.  $-y - 4x + 4y$

\_\_\_\_\_

3.  $5.5a - 1 + 21b + 3a$

\_\_\_\_\_

4.  $2y - 3x + 6x - y$

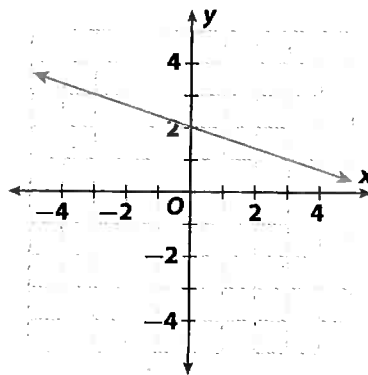
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## Graph Linear Equations

**EXAMPLE** Graph  $y = -\frac{1}{3}x + 2$ .  
 Step 1: Make a table of values.

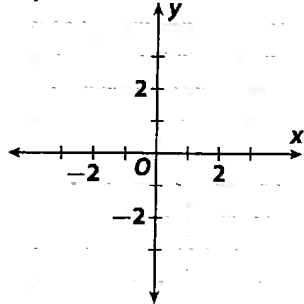
x	$y = -\frac{1}{3}x + 2$	(x, y)
0	$y = -\frac{1}{3}(0) + 2 = 2$	(0, 2)
3	$y = -\frac{1}{3}(3) + 2 = 1$	(3, 1)

Step 2: Plot the points.  
 Step 3: Connect the points with a line.

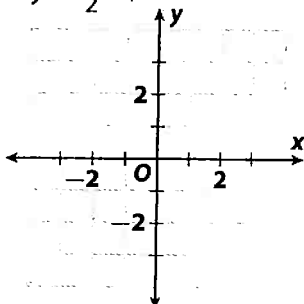


**Graph each equation.**

5.  $y = 4x - 1$



6.  $y = \frac{1}{2}x + 1$



7.  $y = -x$

