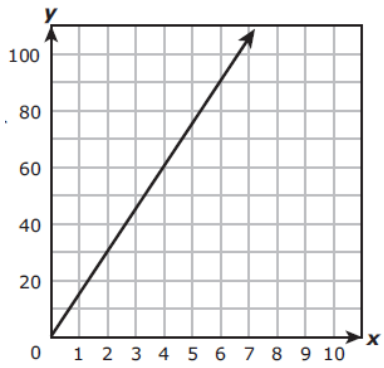
Foundations for Algebra I
Pre – Algebra Skills Reviews

x	y
4	8
6	12
11	22
13	26



Foundations for Algebra I
Pre – Algebra Skills Reviews

Lesson/Title

1-1 Words and Expressions.
1-2 Variables and Expressions.
1-3 Properties
1-4 Ordered Pairs and Relations
1-5 Words, Equations, Tables, and Graphs
1-6 Scatter Plots.

2-1 Integers and Absolute Value
2-2 Adding Integers
2-3 Subtracting Integers.
2-4 Multiplying Integers.
2-5 Dividing Integers.
2-6 Graphing in Four Quadrants
2-7 Translations and Reflections on the Coordinate Plane.

3-1 Fractions and Decimals
3-2 Rational Numbers
3-3 Multiplying Rational Numbers
3-4 Dividing Rational Numbers
3-5 Adding and Subtracting Like Fractions
3-6 Adding and Subtracting Unlike Fractions.

4-1 The Distributive Property
4-2 Simplifying Algebraic Expressions.
4-3 Solving Equations by Adding or Subtracting
4-4 Solving Equations by Multiplying or Dividing
4-5 Solving Two-Step Equations
4-6 Writing Equations.

5-1 Perimeter and Area
5-2 Solving Equations with Variables on Each Side.
5-3 Inequalities.
5-4 Solving Inequalities
5-5 Solving Multi-Step Equations and Inequalities.

6-1 Ratios
6-2 Unit Rates
6-3 Converting Rates and Measurements
6-4 Proportional and Nonproportional Relationships.
6-5 Solving Proportions
6-6 Scale Drawings and Models

6-7 Similar Figures
6-8 Dilations
6-9 Indirect Measurement.

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Lesson/Title

7-1 Fractions and Percents
7-2 Fractions, Decimals, and Percents.
7-3 Using the Percent Proportion.
7-4 Find Percent of a Number Mentally.
7-5 Using Percent Equations
7-6 Percent of Change.
7-7 Simple and Compound Interest
7-8 Circle Graphs

8-1 Functions.
8-2 Sequences and Equations
8-3 Representing Linear Functions
8-4 Rate of Change
8-5 Constant Rate of Change and Direct Variation
8-6 Slope
8-7 Slope-Intercept Form
8-8 Writing Linear Equations
8-9 Prediction Equations.
8-10 Systems of Equations

9-1 Powers and Exponents
9-2 Prime Factorization.
9-3 Multiplying and Dividing Monomials
9-4 Negative Exponents
9-5 Scientific Notation.
9-6 Powers of Monomials
9-7 Linear and Nonlinear Functions.
9-8 Quadratic Functions
9-9 Cubic and Exponential Functions

10-1 Squares and Square Roots
10-2 The Real Number System.
10-3 Triangles
10-4 The Pythagorean Theorem.
10-5 The Distance Formula
10-6 Special Right Triangles.

Foundations for Algebra I
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Words and Expressions

Write a numerical expression for each verbal phrase.

1. the difference of seventeen and three

2. the sum of eight, twenty, and thirty-five

3. one hundred decreased by twenty-five

4. the product of twenty and thirty

Evaluate each expression.

5. $2 - 3 \cdot 0$

6. $25 \div 5 - 4$

7. $9 \div 3 \cdot 2 + 1$

8. $5 + 2 \cdot 8 + 2 - 5$

9. $5 + 2 \cdot 3 + 4$

10. $10 - 2 \cdot 4 - 1$

11. $(14 + 6) \div 5$

12. $100 + 50 \div 10$

13. $6(4 + 5)$

14. $\frac{(8 \cdot 9)}{(3 \cdot 4)}$

15. $56 \div (3 + 4)$

16. $2[(4 + 5) \cdot 3]$

Foundations for Algebra I
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Variables and Expressions

ALGEBRA Translate each phrase into an algebraic expression.

1. two inches shorter than Kathryn's height

2. some number added to seventeen

3. three pounds lighter than Adlai's weight

4. three dollars more than the cost of a ticket

5. half as many pieces of candy

ALGEBRA Evaluate each expression if $x = 4$, $y = 6$, and $z = 3$.

6. $x + y + z$

7. $3x + y$

8. $15z$

9. $3(x + z)$

ALGEBRA Evaluate each expression if $a = 7$, $b = 9$, $c = 2$, and $d = 5$.

10. $a + b + c$

11. $a + b - (c + d)$

12. $(a + b) \cdot (c + d)$

13. $c(4 + d)$

14. $ab - cd$

15. $\frac{bc}{a - d}$

Foundations for Algebra I
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Properties

Name the property shown by each statement.

1. $9 \cdot 7 = 7 \cdot 9$

2. $1 \cdot 87 = 87$

3. $3(6a) = (3 \cdot 6)a$

4. $4 + (6 + 8) = (4 + 6) + 8$

ALGEBRA Simplify each expression.

5. $(a \cdot 0) \cdot 6$

6. $b + (7 + 5)$

7. $(x + 5) + 4$

8. $(6a)10$

9. $16p \cdot 0$

10. $16 + (22 + x)$

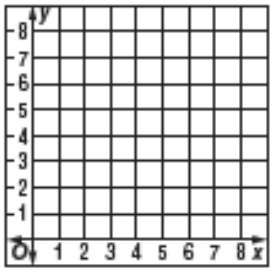
11. $3(11k)$

12. $16 + (y + 9)$

Foundations for Algebra I
Pre – Algebra Skills Reviews

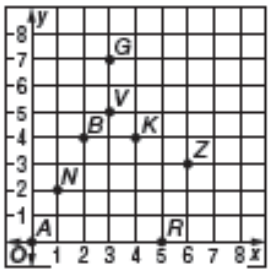
Ordered Pairs and Relations

Graph each ordered pair on the coordinate plane.



1. $A(2, 5)$
2. $M(6, 4)$
3. $Q(7, 8)$
4. $W(0, 6)$

Write the ordered pair that names each point.

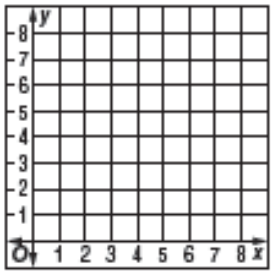


5. Z
6. G

Express each relation as a table and as a graph. Then determine the domain and range.

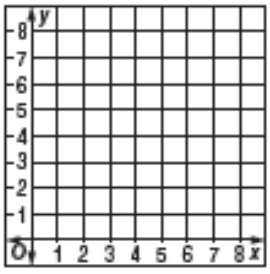
7. $\{(3, 7), (1, 1), (6, 5), (2, 4)\}$

X	Y



8. $\{(2, 3), (3, 2), (1, 7), (7, 1)\}$

X	Y



Foundations for Algebra I
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Words, Equations, Tables, and Graphs

Copy and complete each function table. Then state the domain and range of the function.

1. A phone call costs $3 a minute.

Input (x)	Rule:	Output (y)
1		
5		
10		
20		

2. Jared has 4 less than 3 times the number of trophies that Zach has.

Input (x)	Rule:	Output (y)
2		
4		
6		
8		

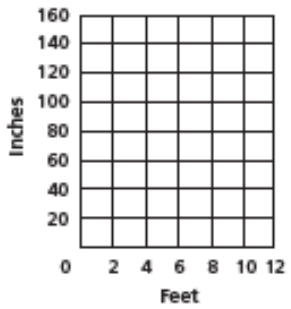
3. **MULTIPLE REPRESENTATIONS** There are 12 inches in 1 foot.

   a. **ALGEBRAIC** Write an equation to find the number of inches in any number of feet.

   b. **TABULAR** Make a function table to find the number of inches in 4, 6, 8, and 10 feet.

Input (x)	Rule:	Output (y)

   c. **GRAPHICAL** Graph the ordered pairs for the function.



Foundations for Algebra I
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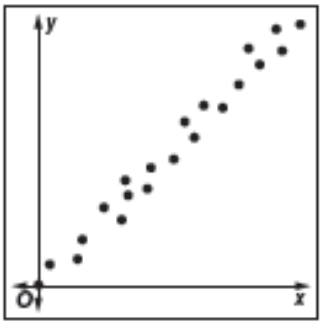
Scatter Plots

Tell whether each scatter plot shows a *positive*, *negative*, or *no* relationship.

1. 

2. 

For Exercises 5–8, use the following information.

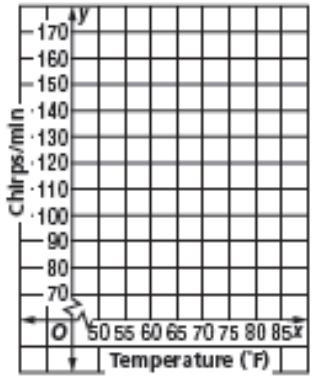
SCIENCE Scientists have determined that there may be a relationship between temperature and the number of chirps produced by crickets. The table gives the temperature and the number of chirps per minute for several cricket samples.

Temperature (°F)	Chirps/min
71	138
68	97
75	152
80	158
60	81
75	155
84	165

3. Make a scatter plot of the data.

4. Does there appear to be a relationship between temperature and chirps? Explain.

5. Suppose the outside temperature is 65°. About how many chirps per minute would you expect from a cricket?



Foundations for Algebra I
Pre – Algebra Skills Reviews

Integers and Absolute Value

Write an integer for each situation. Then graph on a number line.

1. a bank deposit of $200

2. 450 feet above sea level

Replace each ● with <, >, or = to make a true sentence.

3. $1 \bullet 0$

4. $-3 \bullet 0$

5. $0 \bullet -1$

6. $0 \bullet 9$

7. $5 \bullet 5$

8. $0 \bullet -6$

9. $4 \bullet 10$

10. $6 \bullet -6$

Evaluate each expression.

11. $|1|$

12. $|-10|$

13. $|-8|$

14. $0 + |-1|$

15. $|-6| + |-5|$

16. $|-8| - |-8|$

ALGEBRA Evaluate each expression if $a = -3$, $b = 0$, and $c = 1$.

17. $|a| - b$

18. $|c| + 2$

19. $9 - |a|$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Adding Integers

Find each sum.

1. $-7 + (-5)$
2. $10 + 9$
3. $-12 + (-5)$
4. $-13 + (-3)$
5. $72 + (-10)$
6. $72 + 10$
7. $-13 + (-11)$
8. $-52 + 52$
9. $-22 + 4$
10. $14 + 8$
11. $-21 + (-9)$
12. $15 + (-5)$
13. $0 + 31$
14. $-45 + (-15)$
15. $-6 + 20$
16. $24 + (-11)$
17. $4 + 5 + (-4)$
18. $-4 + (-5) + 6$
19. $-3 + 8 + (-9)$
20. $0 + (-8) + 22$
21. $-31 + 19 + (-19)$
22. $32 + (-4) + (-9)$

Foundations for Algebra I
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Subtracting Integers

Find each difference.

1. $-2 - (-8)$
2. $4 - (-11)$
3. $-7 - 6$
4. $15 - 2$
5. $-4 - (-10)$
6. $4 - 6$
7. $0 - (-15)$
8. $-16 - (-10)$
9. $1 - (-2)$
10. $-2 - (-19)$
11. $13 - 17$
12. $20 - (-15)$

ALGEBRA Evaluate each expression if $a = -9$, $b = 4$, and $c = -5$.

13. $a - 8$
14. $10 - c$
15. $11 - b$
16. $15 - a$
17. $c - (-14)$
18. $-33 - a$
19. $14 - c$
20. $b - c$
21. $a - b$
22. $a + b - c$
23. $b + 15 + a$
24. $a - (-b) + c$

Foundations for Algebra I
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Multiplying Integers

Find each product.

1. $8(16)$
2. $-4(17)$
3. $-1(-40)$
4. $-5(-7)$
5. $-2(-15)(-6)$
6. $3(-5)(-8)$
7. $-10(17)(-2)$
8. $-2(-2)(-2)$

ALGEBRA Simplify each expression.

9. $-6r \cdot (12s)$
10. $-15 \cdot (9v)$
11. $2ab \cdot (-25)$
12. $-27y \cdot (-z)$
13. $19h(-1)(-2s)$
14. $-h(-jk)$
15. $(-1)(-a)(-bc)$
16. $(-1)(-fg)(-xy)$

ALGEBRA Evaluate each expression if $a = -1$, $b = -6$, and $c = 5$.

17. $-11a$
18. $4ab$
19. $-8bc$
20. $-10ac$
21. $-11a(-bc)$
22. $4ab(-8c)$
23. $9a(-2b)(5c)$
24. $-3a(-2b)(-c)$

25. **REAL ESTATE** In Montyville, the value of homes has experienced an annual increase of -2 percent. If the rate continues, what will be the increase over 10 years?

Foundations for Algebra I
Pre – Algebra Skills Reviews

Dividing Integers

Find each quotient.

1. $16 \div 4$
2. $-27 \div 3$
3. $25 \div (-5)$
4. $63 \div (-9)$

5. $28 \div (-4)$
6. $-56 \div (-8)$
7. $72 \div 8$
8. $-21 \div (-7)$

9. $\frac{35}{-7}$
10. $\frac{-144}{12}$

11. What is -54 divided by 9?
12. Divide -27 by -3.

ALGEBRA Evaluate each expression if $x = -8$ and $y = -12$.

13. $x \div 2$
14. $x \div (-4)$
15. $36 \div y$
16. $0 \div y$

17. $\frac{x}{-2}$
18. $\frac{y}{3}$
19. $\frac{0}{x}$
20. $\frac{-112}{x}$

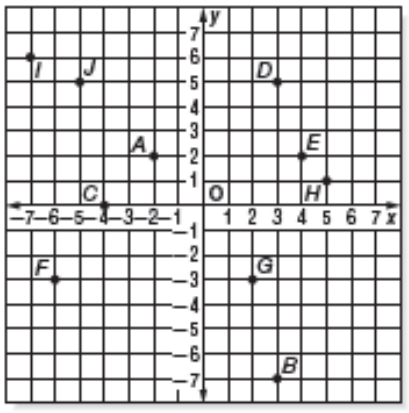
Find the average (mean) of each group of numbers.

21. 3, 12, 6
22. $-8, -1, -3$
23. $-8, 15, 5, 8$
24. $-3, -10, 2, -4, 0$

Foundations for Algebra I
Pre – Algebra Skills Reviews

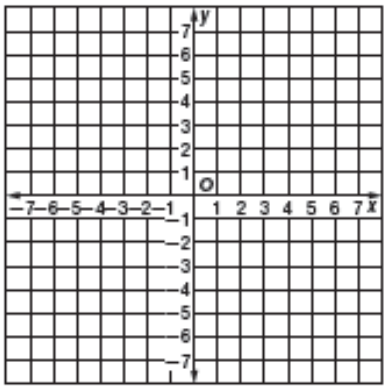
Graphing in Four Quadrants

Name the ordered pair for each point graphed at the right.



1. *A*
2. *C*
3. *E*
4. *I*

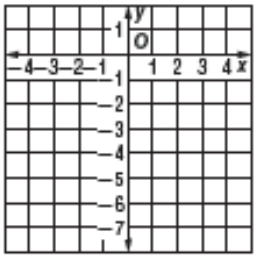
Graph and label each point on the coordinate plane. Name the quadrant in which each point is located.



5. *K* (1, 0)
6. *M* (−2, 4)
7. *P* (6, −2)
8. *R* (−3, −4)
9. *T* (3, 6)

10. **ALGEBRA** Make a table of values and graph six sets of ordered pairs for the equation $y = x - 4$. Describe the graph.

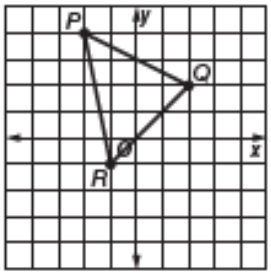
$y = x - 4$		
x	**y**	**(x, y)**



Foundations for Algebra I
Pre – Algebra Skills Reviews
Translations and Reflections on the Coordinate Plane

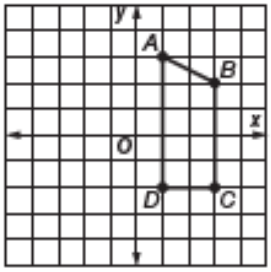
For Exercises 1 and 2, use the coordinate plane below. Triangle *PQR* is shown.

1. Find the coordinates of the vertices of the image of $\triangle PQR$ translated 3 units to the left and 4 units down.

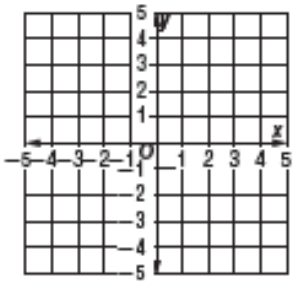


For Exercises 3 and 4, use the coordinate plane below. Figure *ABCD* is shown.

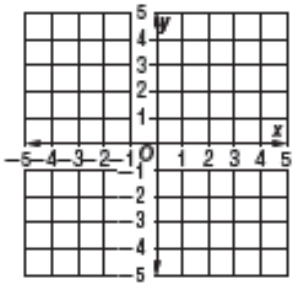
2. Find the coordinates of the vertices of the image of figure *ABCD* translated 1 unit to the right and 6 units down.



3. The vertices of figure *HJKL* are $H(3, 1)$, $J(5, -2)$, $K(1, -4)$, and $L(1, 0)$. Graph the figure and its image after a reflection over the y-axis.



4. The vertices of figure *STUV* are $S(-3, 2)$, $T(-2, 4)$, $U(3, 3)$, and $V(2, 1)$. Graph the figure and its image after a reflection over the x-axis.



Foundations for Algebra I
Pre – Algebra Skills Reviews

Fractions and Decimals

Write each fraction as a decimal. Use a bar to show a repeating decimal.

1. $\frac{3}{4}$

2. $\frac{2}{5}$

3 $\frac{13}{100}$

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

5. $\frac{1}{4}$

6. $\frac{7}{50}$

7. $\frac{1}{8}$

8. $\frac{1}{12}$

9. $\frac{7}{11}$

10. $-\frac{5}{9}$

Replace each ● with $<$, $>$, or $=$ to make a true sentence.

11. $\frac{1}{8}$ ● 0.12

12. $\frac{2}{3}$ ● 0.7

13. 0.1 ● $\frac{1}{11}$

14. $0.\overline{16}$ ● $\frac{1}{6}$

15. Order $\frac{9}{11}$, 0.99, and $\frac{9}{10}$ from least to greatest.

Foundations for Algebra I
Pre – Algebra Skills Reviews

Rational Numbers

Write each number as a fraction.

1. 13

2. $1\frac{1}{4}$

3. $-3\frac{4}{5}$

4. $6\frac{5}{8}$

5. 0.6

6. 0.25

7. 0.11

8. 2.8

9. $3.\overline{2}$

10. 1.125

11. 0.16

12. 4.06

13. Write 85 hundredths as a fraction in simplest form.

Identify all sets to which each number belongs (W = whole numbers, I = integers, Q = rational numbers).

14. 16

15. −2.54

16. −4

17. . 2.2020020002. . .

Foundations for Algebra I
Pre – Algebra Skills Reviews

Multiplying Rational Numbers

Find each product. Write in simplest form.

1. $\frac{1}{3} \cdot \left(-\frac{1}{4}\right)$

2. $-\frac{2}{5} \cdot \frac{6}{7}$

3. $\frac{2}{9} \cdot \frac{3}{5}$

4. $\frac{3}{11} \cdot \frac{5}{9}$

5. $\frac{3}{4} \cdot \frac{2}{5}$

6. $-\frac{1}{6} \cdot \left(-\frac{4}{7}\right)$

7. $\frac{5}{16} \cdot 4$

8. $5\frac{1}{2} \cdot \frac{2}{11}$

9. $-12\frac{2}{3} \cdot 7\frac{1}{2}$

10. $-\frac{5}{36} \cdot \left(-\frac{9}{25}\right)$

11. $-6\frac{2}{5} \cdot \left(-2\frac{2}{9}\right)$

12. $\frac{7}{45} \cdot \frac{9}{42}$

ALGEBRA Evaluate each expression if $a = \frac{9}{12}$, $b = -2\frac{1}{4}$, and $c = \frac{2}{5}$. Write the product in simplest form.

13. ab

14. $-2b$

15. $\frac{5}{8}ac$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Dividing Rational Numbers

Find the multiplicative inverse of each number.

1. $\frac{7}{12}$
2. $-\frac{3}{10}$
3. $\frac{1}{8}$

Find each quotient. Write in simplest form.

4. $\frac{1}{3} \div \frac{7}{18}$
5. $-\frac{2}{5} \div \frac{4}{25}$
6. $-5 \div \frac{1}{7}$
7. $3 \div \frac{1}{4}$
8. $-15 \div \frac{1}{2}$
9. $\frac{4}{9} \div \frac{5}{12}$
10. $12\frac{3}{5} \div 2\frac{7}{10}$
11. $-\frac{3}{11} \div \frac{6}{22}$
12. $\frac{1}{8} \div \frac{15}{16}$
13. $\frac{x}{6} \div \frac{x}{30}$
14. $\frac{12}{5x} \div \frac{6}{2x}$
15. $\frac{m}{16} \div \frac{mp}{7}$
16. $\frac{3}{5c} \div \frac{1}{10c}$
17. $\frac{pq}{6} \div \frac{q}{8}$
18. $\frac{x^2}{7} \div \frac{2x}{21}$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Adding and Subtracting Like Fractions

Find each sum or difference. Write in simplest form.

1. $\frac{4}{15}+\frac{6}{15}$

2. $\frac{7}{12}+\frac{11}{12}$

3. $\frac{11}{12}-\frac{5}{12}$

4. $\frac{5}{8}+\frac{7}{8}$

5. $\frac{5}{6}+\frac{5}{6}$

6. $4\frac{4}{5}+3\frac{2}{5}$

7. $26\frac{7}{12}+11\frac{11}{12}$

9. $20\frac{3}{4}-3\frac{1}{4}$

9. $\frac{a}{6}+\frac{4a}{6}$

10. $\frac{7c}{16}+\frac{7c}{16}$

11. $\frac{7x}{9}-\frac{7x}{9}$

12. $\frac{3m}{5}+\frac{8m}{5}$

Evaluate each expression if $x=\frac{5}{8}$, $y=1\frac{3}{8}$, and $z=\frac{1}{8}$.

13. $x+y$

14. $y-x$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Adding and Subtracting Unlike Fractions

Find each sum or difference. Write in simplest form.

1. $\frac{4}{7}+\frac{1}{3}$

2. $\frac{2}{5}+\frac{3}{4}$

3. $\frac{5}{12}+\frac{23}{24}$

4. $\frac{10}{11}-\frac{1}{2}$

5. $\frac{19}{20}+\frac{1}{4}$

6. $-\frac{9}{10}-\frac{1}{3}$

7. $-\frac{3}{8}+\frac{1}{6}$

8. $\frac{33}{100}-\frac{1}{10}$

9. $5\frac{2}{3}+2\frac{1}{6}$

10. $1\frac{7}{8}+3\frac{1}{3}$

11. $-7\frac{1}{2}+\frac{3}{4}$

12. $2\frac{2}{3}+1\frac{1}{4}$

13. $11\frac{15}{16}-7\frac{1}{2}$

14. $8\frac{5}{9}+1\frac{1}{6}$

15. $8\frac{2}{3}-3\frac{1}{3}$

16. $-21\frac{7}{16}+13\frac{1}{4}$

Foundations for Algebra I
Pre – Algebra Skills Reviews

The Distributive Property

Use the Distributive Property to write each expression as an equivalent expression. Then evaluate the expression.

1. $8(50 + 4)$
2. $(20 + 9)5$
3. $2(60 + 4)$
4. $7(40 - 2)$

5. $-3(7 - 11)$
6. $-10(12 - 4)$
7. $(21 + 9)(-5)$
8. $-7(1 - 10)$

Use the Distributive Property to write each expression as an equivalent algebraic expression.

9. $4(d + 2)$
10. $1(u - 3)$
11. $-6(f + 5)$
12. $-2(g - 3)$

13. $-1(2 - y)$
14. $-7(a + 1)$
15. $11(k - 20)$
16. $-9(r - 1)$

17. $-3(w - 10)$
18. $-10(c + 9)$
19. $2(11 - q)$
20. $-4(12 - f)$

21. $6(r - 20)$
22. $7(2 - j)$
23. $-1(m + 1)$
24. $-2(v - 8)$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Simplifying Algebraic Expressions

Identify the terms, like terms, coefficients, and constants in each expression.

1. $7a + a$

2. $m + 3m + 8$

3. $10b - bc + 1 + 3bc$

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

Simplify each expression.

5. $13c - 7 + c - d$

6. $5h + h - 4h + 1 - 2h$

7. $2(v - 5) + 7v + 4$

8. $-8 - 7(y + 2)$

9. $-18(c - 1) - 18$

10. $12(n - 4) - 3n$

11. $6(r - 4) + r + 30 - 7r$

12. $-5 + 5a - 4 - 2a + 3a$

13. $21 - 8(v + 3) + 3 + 7v$

14. $-11f + 6 - f + 4 + 13f - 9$

15. $3(d - 4) + 2 - 2d + 1 - d$

Foundations for Algebra I
Pre – Algebra Skills Reviews
Solving Equations by Adding or Subtracting

Solve each equation. Check your solution.

1. $r + 1 = -5$

2. $t - 3 = -11$

4. $q - 4 = 5$

4. $n - 11 = 1$

5. $y - 7 = -5$

6. $g + 1 = 10$

7. $r + 10 = -6$

8. $f - 6 = 6$

9. $a - 12 = -19$

10. $h - 9 = 12$

11. $d - 15 = -14$

12. $b + 13 = -20$

13. $j - 9 = -8$

14. $n + 12 = 0$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Solving Equations by Multiplying or Dividing

Solve each equation. Check your solution.

1. $3x = 24$
2. $\frac{m}{-5} = -15$
3. $-4f = 16$
4. $\frac{u}{2} = 12$

5. $\frac{n}{8} = -24$
6. $-4r = -12$
7. $-9h = 81$
8. $\frac{c}{-10} = 1$

9. $-1f = 11$
10. $\frac{r}{-1} = 22$
11. $8d = -16$
12. $\frac{r}{15} = 45$

13. $\frac{x}{-8} = -1$
14. $5g = -20$
15. $\frac{p}{6} = 0$
16. $7y = 7$

17. $2r = 0$
18. $-1t = 19$
19. $\frac{n}{-12} = 12$
20. $-15j = 120$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Solving Two-Step Equations

Solve each equation. Check your solution.

1. $3x + 10 = 1$
2. $\frac{a}{5} + 8 = 9$
3. $8w - 12 = -4$
4. $\frac{u}{12} - 8 = -8$
5. $7p + 11 = -31$
6. $12d + 15 = 3$
7. $2h + 10 = -12$
8. $6k - 9 = 15$
9. $\frac{w}{-5} - 4 = -2$
10. $2z - 4 - z = 4$
11. $10 - 5h + 2 = 32$
12. $\frac{r}{-7} - 5 = -6$
13. $7f - 24 = 25$
14. $6 - \frac{m}{6} - 8 = 0$
15. $10 - d = 19$
16. $6q - 4 = -16$
17. $\frac{m}{8} - 12 - 3 = -12$
18. $5b + 6 - 6b + 2 = 19$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Writing Equations

Translate each sentence into an equation. Then find each number.

1. Eleven less than 5 times a number is 24.

2. Five less than the product of -3 and a number is -2.

3. The difference between 5 times a number and 4 is 16.

4. The difference between 12 and ten times a number is -28.

5. Eleven less than five times a number is 19.

6. Seven less than twice a number is 43.

Solve each problem by writing and solving an equation.

7. **SHOPPING** The total cost of a suit and 4 ties is \$292. The suit cost \$200. Each tie cost the same amount. Find the cost of one tie.

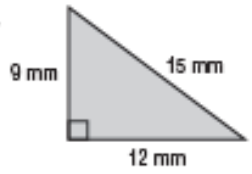
8. **AGES** Mary's sister is 7 years older than Mary. Their combined ages add up to 35. How old is Mary?

Foundations for Algebra I
Pre – Algebra Skills Reviews

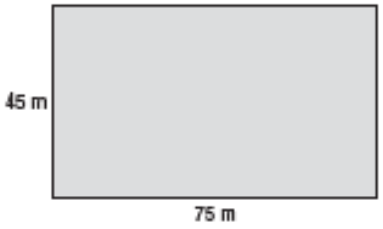
Perimeter and Area

Find the perimeter and area for each figure.

1.



2.

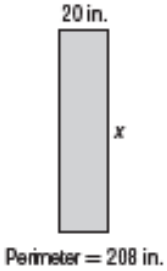


3. a right triangle with legs of 7 inches and 24 inches and a hypotenuse of 25 inches

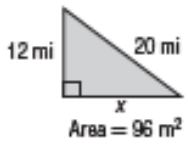
4. a square that is 25 centimeters on each side

Find the missing dimension for each figure.

5.



6.



7. The area of a rectangle is 319 square kilometers. Its width is 11 kilometers. Find its length.

Foundations for Algebra I
Pre – Algebra Skills Reviews

Solving Equations with Variables on Each Side

Solve each equation. Check your solution.

1. $3x + 2 = 5x$

2. $n - 12 = 3n$

3. $2f + 3 = 11f - 24$

4. $8y + 11 = 2y + 29$

5. $2a - 3 = 9a - 10$

6. $5b = 21 + 4b$

7. $-s + 3 = 5s + 21$

8. $7 - 4c = 3c + 35$

9. $16k - 23 = 6k - 13$

10. $w - 20 = 6w$

11. $3t + 17 = t - 3$

12. $11j = 6j - 15$

13. $5m - 6 = 8m + 9$

14. $-4p - 7 = 5p + 11$

15. $-7n - 16 = 4n + 17$

16. $5d = 9d - 18$

Define a variable and write an equation to find each number. Then solve.

17. Three times a number equals 40 more than five times the number. What is the number?

18. Eight times a number equals 24 more than two times the number. What is the number?

Foundations for Algebra I
Pre – Algebra Skills Reviews

Inequalities

Write an inequality for each sentence.

1. More than 100,000 fans attended the opening football game at The Ohio State University.

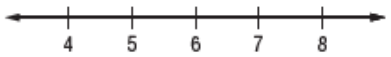
2. A savings account decreased by $50 is now less than $740.

For the given value, state whether each inequality is *true* or *false*.

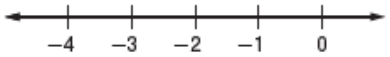
3. $11 + n < 32, n = 4$

Graph each inequality on a number line.

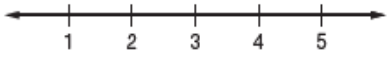
4. $a < 6$



5. $t \geq -2$



6. $d \leq 3$



Write the inequality for each graph.

7.

8.

9.

Foundations for Algebra I
Pre – Algebra Skills Reviews

Solving Inequalities

Solve each inequality. Check your solution.

1. $p + 9 > 13$

2. $-12 \geq 7 + x$

3. $5 > -3 + y$

4. $b - 15 > 11$

5. $j - 4 \leq -10$

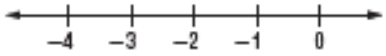
6. $13 > w - (-14)$

7. $-15 \leq d + (-2)$

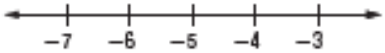
8. $15 > c + 3$

Solve each inequality. Then graph the solution on a number line.

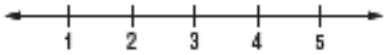
9. $-8x > 16$



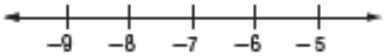
10. $7y < -35$



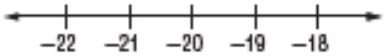
11. $-6z < -18$



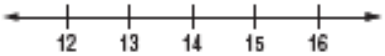
12. $14 > -2k$



13. $-10t \geq 200$



14. $\frac{y}{7} < 2$



15. **SHOPPING** Chantal would like to buy a new pair of running shoes. Shoes that she likes start at $85. If she has already saved $62, what is the least amount she must still save?

Foundations for Algebra I
Pre – Algebra Skills Reviews

Solving Multi-Step Equations and Inequalities

Solve each equation. Check your solution.

1. $2(g - 7) = 16$

2. $5(x + 2) = 30$

3. $3(f + 2) + 9 = 13 + 5f$

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

5. $2(c - 3) = 76$

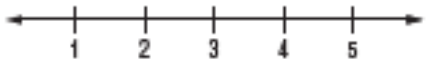
6. $7(x - 2) = 5(x + 2)$

7. $6 + 6(2t - 1) = 3 + 12t$

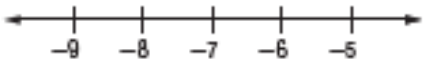
8. $9t - 21 = 3(t - 7) + 6t$

Solve each inequality. Graph the solution on a number line.

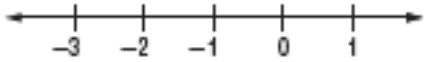
9. $3x + 9 < 18$



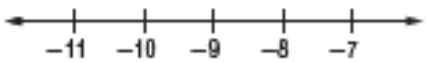
10. $5 + 2c < -9$



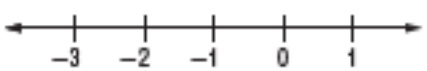
11. $11 + 2b \leq 3(2 - b)$



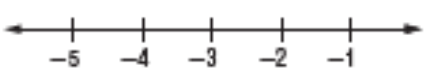
12. $\frac{m}{3} + 5 \geq 2$



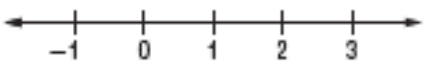
13. $y - 3 < 5y + 1$



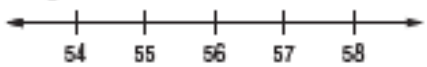
14. $20 - 2n > 26$



15. $-2(3 + t) < -8$



16. $\frac{n}{4} - 9 > 5$



Foundations for Algebra I
Pre – Algebra Skills Reviews

Ratios

Express each ratio as a fraction in simplest form.

1. 8 pencils to 12 pens

2. 42 textbooks to 28 students

3. 75 cats to 100 dogs

4. 6 aces out of 24 serves

5. 50 nickels out of 125 coins

6. 9 children to 24 adults

7. 18 inches to 3 feet

8. 1 yard to 1 foot

9. 3 pounds to 15 ounces

10. 15 inches to 2 yards

11. 8 ounces to 2 pounds

12. 7 quarts to 2 gallons

Foundations for Algebra I
Pre – Algebra Skills Reviews

Unit Rates

Express each rate as a unit rate. Round to the nearest tenth or nearest cent, if necessary.

1. $9 for 6 cans of soup

2. $39 for a case of 75 bananas

3. 21 new pairs of sneakers in 7 years

4. 52 feet for 8 costumes

5. **JUICE** A 64-ounce container of sports juice costs $6.50. A 48-ounce container of the same juice costs $4.25. Which size container is the better buy?

6. **STUDENTS** There are 156 sixth graders and 7 sixth-grade teachers. There are 120 fifth graders and 5 fifth-grade teachers. Which grade has the lower student to teacher ratio?

7. **ANIMALS** During normal sleep, a bear's heart beats about 50 times a minute. In its deepest state of hibernation, a bear's heart may beat 50 times in 6 minutes. During deep hibernation, how many times would the bear's heart beat in 45 minutes?

8. **ICE CREAM** An ice cream store makes 144 quarts of ice cream in 8 hours. How many quarts could be made in 12 hours?

Foundations for Algebra I
Pre – Algebra Skills Reviews

Converting Rates and Measurements

Convert each rate using dimensional analysis. Round to the nearest hundredth if necessary.

1. 12 m/min = ■ cm/s
2. 8 qt/min = ■ gal/h
3. 32 ft/h = ■ yd/day
4. 56 mi/h = ■ ft/min
5. 220 mi/h = ■ yd/min
6. 3 km/h = ■ m/s

Complete each conversion. Round to the nearest hundredth if necessary.

7. 5 m ≈ ■ yd
8. 1500 mi ≈ ■ m
9. 42 in. ≈ ■ cm
10. 38 ft ≈ ■ m
11. 1200 km ≈ ■ ft
12. 18 qt ≈ ■ ml

Convert each rate using dimensional analysis. Round to the nearest hundredth if necessary.

13. 10 km/h ≈ ■ mi/h
14. 40 gal/s ≈ ■ L/h
15. 300 miles/h ≈ ■ km/min
16. 120 mi/day ≈ ■ km/week
17. 12 pt/h ≈ ■ L/min
18. 2800 mi/h ≈ ■ km/h

Foundations for Algebra I
Pre – Algebra Skills Reviews

Proportional and Nonproportional Relationships

Determine whether the set of numbers in each table is proportional. Explain.

1.

Number of Socks	1	2	3	4
Cost	$2	$4	$6	$6

2.

Days	1	3	5	6
Pages Read	100	300	550	600

For Exercises 5 and 6, complete each table. Determine whether the pattern forms a proportion.

3. **BABY-SITTING** Aliya earns $7 per hour baby-sitting her neighbors.

Hours	1				
Earnings	$7				

4. **TRAVELING** On a cross-country road trip, a family drives 240 miles each day. Write and solve an equation to determine how far the family has traveled after 4 days.

Foundations for Algebra I
Pre – Algebra Skills Reviews
Solving Proportions

Determine whether each pair of ratios forms a proportion.

1. $\frac{1}{5}, \frac{4}{20}$
2. $\frac{3}{8}, \frac{12}{32}$
3. $\frac{4}{5}, \frac{9}{10}$
4. $\frac{4}{9}, \frac{2}{3}$
5. $\frac{15}{18}, \frac{10}{12}$
6. $\frac{15}{24}, \frac{3}{8}$

ALGEBRA Solve each proportion.

7. $\frac{8}{4} = \frac{t}{8}$
8. $\frac{n}{9} = \frac{4}{18}$
9. $\frac{3}{v} = \frac{12}{32}$
10. $\frac{4}{r} = \frac{5}{20}$
11. $\frac{12}{18} = \frac{m}{81}$
12. $\frac{2}{9} = \frac{6}{k}$
13. $\frac{h}{35} = \frac{3}{7}$
14. $\frac{3}{16} = \frac{u}{40}$
15. $\frac{6}{a} = \frac{1}{3}$
16. $\frac{e}{9.5} = \frac{6.4}{7.6}$
17. $\frac{2.7}{3.0} = \frac{3.6}{x}$
18. $\frac{1.68}{w} = \frac{7}{12}$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Scale Drawings and Models

On a set of architectural drawings for a new school building, the scale is $\frac{1}{4}$ inch = 2 feet. Find the missing lengths of the rooms.

	Room	Drawing Length	Actual Length
1.	Lobby		16 feet
2.	Principal's Office	1.25 inches	
3.	Library		20 feet
4.	School Room	3 inches	
5.	Science Lab	1.5 inches	
6.	Cafeteria		48 feet
7.	Music Room	4 inches	
8.	Gymnasium	13 inches	
9.	Auditorium		56 feet
10.	Teachers' Lounge	1.75 inches	

1. Refer to Exercises 1–10. What is the scale factor?

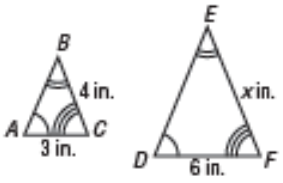
2. **STRUCTURES** A barn is 40 feet wide by 100 feet long. Make a scale drawing of the barn that has a scale of $\frac{1}{2}$ inch = 10 feet.

Foundations for Algebra I
Pre – Algebra Skills Reviews

Similar Figures

In Exercises 1–10, the figures are similar. Find each missing measure.

1.



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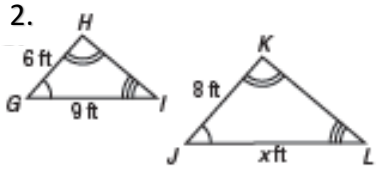

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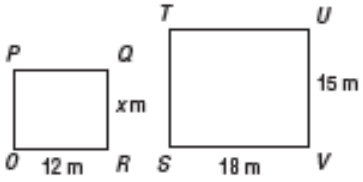

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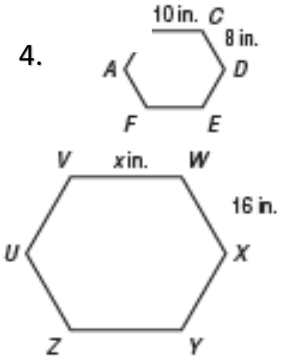

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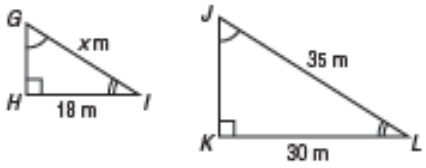

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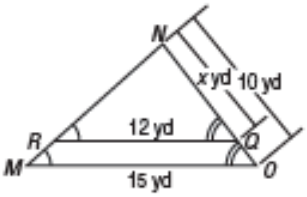
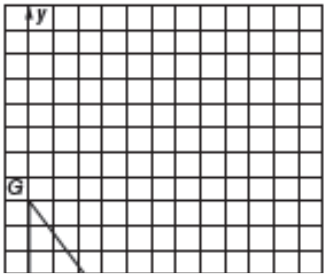


Foundations for Algebra I
Pre – Algebra Skills Reviews

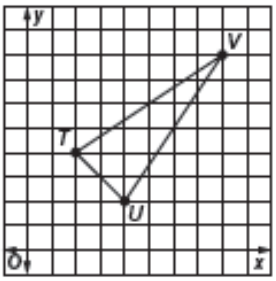
Dilations

Find the vertices of each figure after a dilation with the given scale factor k. Then graph the image.

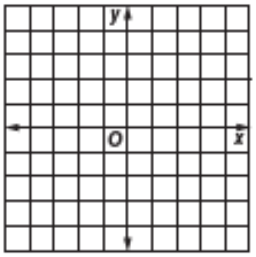
1. $k = 2$



2. $k = \frac{1}{2}$



3. Find the vertices of figure $WXYZ$ after a dilation with a scale factor of $\frac{1}{3}$ if it has vertices $W(-3, 6)$, $X(3, -3)$, $Y(-3, -6)$, and $Z(-6, -3)$. Then graph the image.



Foundations for Algebra I
Pre – Algebra Skills Reviews

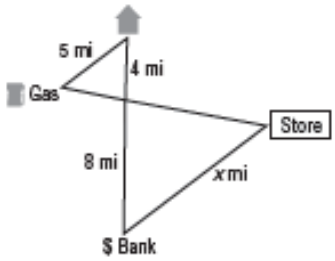
Indirect Measurement

1. **ANIMALS** At the same time a 12-foot adult elephant casts a 4.8-foot shadow, a baby elephant casts a 2-foot shadow. How tall is the baby elephant?

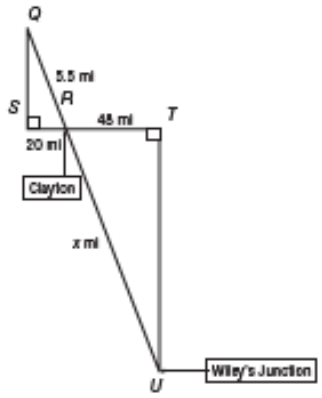
2. **FERRIS WHEEL** Suppose a Ferris wheel is 160 feet high and casts a shadow that is 64 feet long. At the same time, a ticket booth next to the Ferris wheel casts a shadow that is 2.8 feet long. What is the height of the ticket booth?

3. **FARMS** A silo casts a shadow that is 99 feet long. Next to the silo is an 18-foot-tall barn that casts a shadow that is 13.5 feet long. How tall is the silo?

4. **DISTANCES** The triangles below are similar. How far is the store from the bank?



5. **MAPS** The triangles below are similar. How far is Clayton from Wiley's Junction?



Foundations for Algebra I
Pre – Algebra Skills Reviews

Fractions and Percents

Write each percent as a fraction or mixed number in simplest form.

1. 55%

2. $5\frac{1}{2}\%$

3. 300%

4. 50%

5. 85%

6. 0.25%

7. 7.5%

8. 10%

Write each fraction as a percent. Round to the nearest hundredth.

9. $\frac{3}{5}$

10. $\frac{1}{4}$

11. $\frac{23}{4}$

12. $\frac{3}{25}$

13. $2\frac{3}{10}$

14. $\frac{3}{4}$

15. $\frac{23}{50}$

16. $\frac{7}{5}$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Fractions, Decimals, and Percents

Write each percent as a decimal.

1. 85%
2. 325%
3. 0.6%
4. $13\frac{1}{2}\%$
5. 95%
6. 30%
7. 44.4%
8. 100%

Express each decimal or fraction as a percent. Round to the nearest tenth, if necessary.

9. 0.65
10. 0.6
11. 0.47
12. 22.6
13. 0.28
14. 0.0015
15. $\frac{11}{20}$
16. $\frac{5}{8}$
17. $\frac{23}{4}$
18. $\frac{3}{25}$
19. $2\frac{3}{10}$
20. $\frac{300}{630}$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Using the Percent Proportion

Use the percent proportion to solve each problem. Round to the nearest tenth, if necessary.

1. 64 is what percent of 200?

2. What percent of 12 is 9?

3. 10 is what percent of 60?

4. What percent of 30 is 6?

5. 28 is what percent of 42?

6. What percent of 72 is 21?

7. 25 is 80% of what number?

8. 0.84 is 28% of what number?

9. 39 is 17% of what number?

10. 12 is 4% of what number?

11. What is 15% of 98.4?

12. What is 0.5% of 75?

13. What is 25% of 12?

14. What is 12% of 25?

Foundations for Algebra I
Pre – Algebra Skills Reviews
Find Percent of a Number Mentally

Find the percent of each number mentally.

1. 10% of 582
2. 50% of 86
3. 40% of 1500
4. 30% of 120
5. 75% of 44
6. 5% of 40
7. 25% of 480
8. 300% of 5
9. 150% of 82

Estimate.

10. 28% of 19
11. 55% of 32
12. 87% of 158
13. 65% of 73
14. 8% of 224
15. 83% of 9
16. $\frac{1}{3}$% of 941
17. $\frac{1}{2}$% of 376
18. $\frac{1}{5}$% of 2052

Foundations for Algebra I
Pre – Algebra Skills Reviews

Using Percent Equations

Solve each problem using a percent equation.

1. What is 5% of 80?

2. What is 10% of 100?

3. What is 91% of 3800?

4. Find 25% of 68.

5. Find 1.5% of 8400.

6. Find 33.5% of 22.

7. 80 is what percent of 160?

8. 85 is what percent of 500?

9. 0.6 is what percent of 2?

10. 126 is what percent of 140?

11. 29 is 50% of what number?

12. 9 is 45% of what number?

13. 52 is 25% of what number?

14. 99 is 90% of what number?

15. 193.6 is 32% of what number?

16. 87.1 is 67% of what number?

Foundations for Algebra I
Pre – Algebra Skills Reviews

Using Percent Equations

Solve each problem using a percent equation.

1. What is 5% of 80?

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14. 99 is 90% of what number?

15. 193.6 is 32% of what number?

16. 87.1 is 67% of what number?

Foundations for Algebra I
Pre – Algebra Skills Reviews

Percent of Change

Find the percent of change. Round to the nearest tenth, if necessary. Then state whether the percent of change is an *increase* or *decrease*.

1. from 12 m to 18 m

2. from 27 days to 30 days

3. from 10 mm to 3 mm

4. from $875 to $1000

5. from 28 stray cats to 5 stray cats

6. from 12 words to 90 words

7. from 34 workers to 28 workers

8. from 8056 snowflakes to 6381 snowflakes

Find the selling price for each item given the cost and the percent of markup.

9. necklace: $30; 25% markup

10. scooter: $15; 55% markup

11. watch: $22.50; 50% markup

12. video game: $40; 28% markup

Foundations for Algebra I
Pre – Algebra Skills Reviews

Simple and Compound Interest

Find the simple interest to the nearest cent.

1. $720 at 8% for 5 years

2. $385 at 6.2% for 3 years

3. $4250 at 9% for 10 years

4. $2008 at 6% for 3 months

5. $1620 at 5.75% for 9 months

6. $800 at 12.5% for 2 years

Find the total amount in each account to the nearest cent if the interest is compounded annually.

7. $2200 at 5% for 2 years

8. $3850 at 6.25% for 3 years

9. $1000 at 12.25% for 4 years

10. $14,950 at 5.85% for 5 years

11. $4050 at 8.5% for 4 years

12. $1986 at 8.6% for 3 years

Foundations for Algebra I
Pre – Algebra Skills Reviews

Circle Graphs

Construct a circle graph

1.

School Night Bedtimes	
Time	**Percent**
8:00 P.M. – 8:59 P.M.	7
9:00 P.M. – 9:59 P.M.	50
10:00 P.M. – 10:59 P.M.	42
11:00 P.M. or later	1

2. **SAFETY** The circle graph at the right shows the results from a survey of 282 students ages 8–13 who were asked the question, "How often do you wear your bike helmet?" How many more students answered "Seldom or Never" than "Occasionally"?

Foundations for Algebra I
Pre – Algebra Skills Reviews

Functions

Determine whether each relation is a function. Explain.

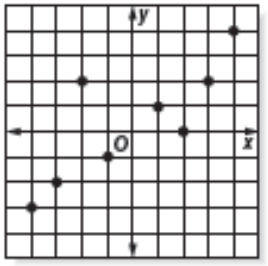
1. $\{(3,-8), (3, 2), (6, -1), (2, 2)\}$

2. $\{(-6, 3), (2, -2), (0, 8), (1, 1)\}$

3.

x	1	−3	8	−8	20
y	2	6	6	5	11

4.



If $f(x) = 4x - 2$, find each function value.

5. $f(3)$ 6. $f(9)$ 7. $f(1)$ 8. $f(4)$

If $g(x) = 3x + 6$, find each function value.

9. $g(2)$ 10. $g(7)$ 11. $g(-4)$ 12. $g(0)$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Sequences and Equations

Describe each sequence using words and symbols.

1. 7, 8, 9, 10, ...

2. 5, 6, 7, 8, ...

3. 3, 5, 7, 9, ...

4. 12, 21, 30, 39, ...

Write an equation that describes each sequence. Then find the indicated term.

5. 5, 8, 11, 14, ...; 9th term

6. 7, 16, 25, 34, ...; 15th term

7. 6, 17, 28, 39, ...; 8th term

8. 25, 44, 63, 82, ...; 12th term

Foundations for Algebra I
Pre – Algebra Skills Reviews

Representing Linear Functions

Find four solutions of each equation. Write the solutions as ordered pairs.

1. $y = 8x - 4$

2. $y = -x + 12$

3. $4x - 4y = 24$

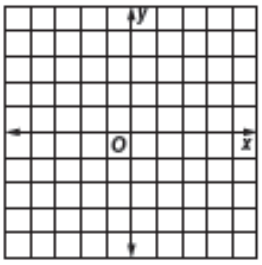
4. $y = 12$

5. $4x - 2y = 0$

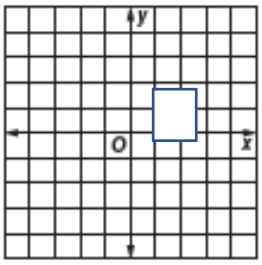
6. $4x - y = 4$

Graph each equation by plotting ordered pairs.

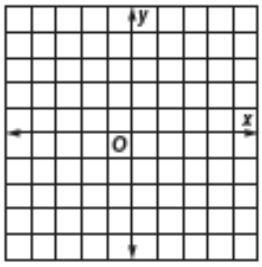
7. $y = 3x - 2$



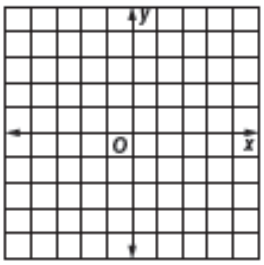
8. $y = -x + 3$



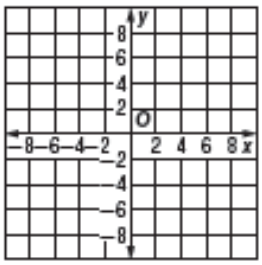
9. $y = -\frac{1}{2}x + \frac{3}{2}$



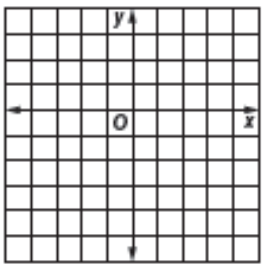
10. $y = -5x$



11. $y = -2x + 6$



12. $y = 5x + 1$

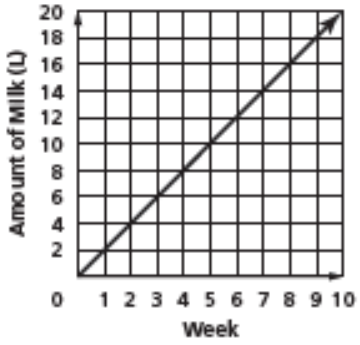


Foundations for Algebra I
Pre – Algebra Skills Reviews

Rate of Change

Find the rate of change for each linear function.

1.



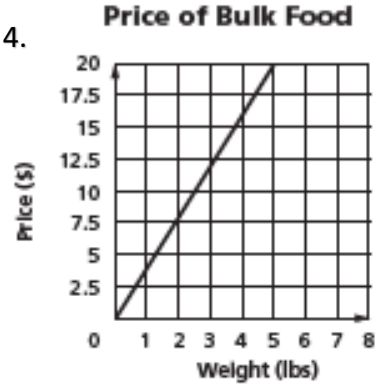
2.

Year	Salary ($)
x	*y*
1	21,000
2	23,500
3	26,000
4	28,500

3.

Time (min)	Temperature (°C)
x	*y*
0	9
1	23
2	37
3	51
4	65

4.



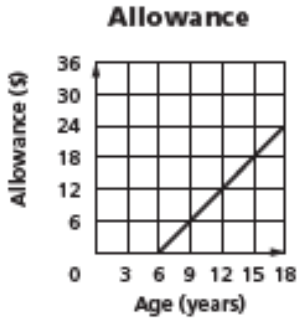
Foundations for Algebra I
Pre – Algebra Skills Reviews
Constant Rate of Change and Direct Variation

Find the constant rate of change for each linear function and interpret its meaning.

1.

Gallons	Quarts
x	*y*
1	4
2	8
3	12
4	16

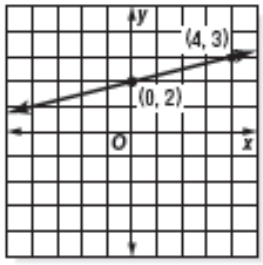
2.

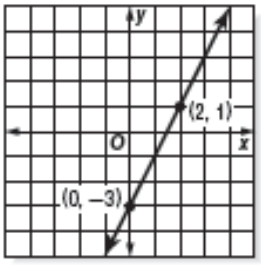


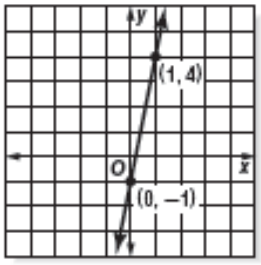
Foundations for Algebra I
Pre – Algebra Skills Reviews

Slope

Find the slope of each line.

1. 

2. 

3. 

Find the slope of the line that passes through each pair of points.

4. $A(1, -5), B(6, -7)$

5. $C(7, -3), D(8, 1)$

6. $E(7, 2), F(12, 6)$

7. $P(2, -2), Q(7, -1)$

8. $R(-5, -2), S(-5, 3)$

9. $T(5, -6), U(8, -12)$

10. **CAMPING** A family camping in a national forest builds a temporary shelter with a tarp and a 4-foot pole. The bottom of the pole is even with the ground, and one corner is staked 5 feet from the bottom of the pole. What is the slope of the tarp from that corner to the top of the pole?

Foundations for Algebra I
Pre – Algebra Skills Reviews

Slope-Intercept Form

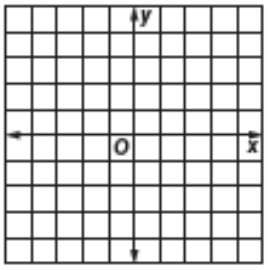
State the slope and the y-intercept for the graph of each equation.

1. $y = 12x - 4$

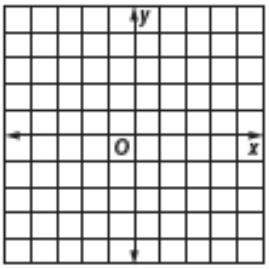
2. $3x - y = 6$

Given the slope and y-intercept, graph each line.

3. slope $= -2$,
y-intercept $= 2$

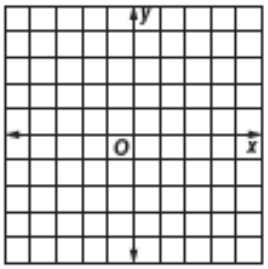


4. slope $= \frac{2}{3}$,
y-intercept $= -3$

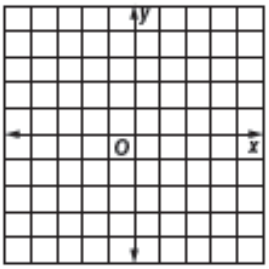


Graph each equation using the slope and y-intercept.

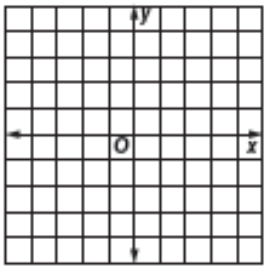
5. $y = 5x - 1$



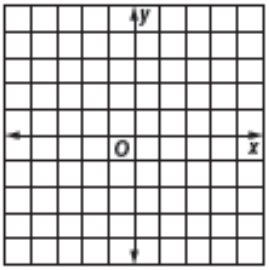
6. $y = -x + 2$



7. $y = 2x + 2$



8. $y = x - 3$



Foundations for Algebra I
Pre – Algebra Skills Reviews

Writing Linear Equations

Write an equation for each line in slope-intercept form.

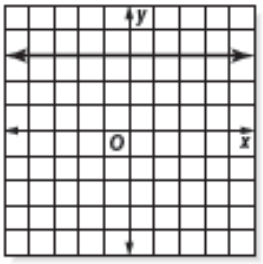
1. slope = 7,
   y-intercept = 2

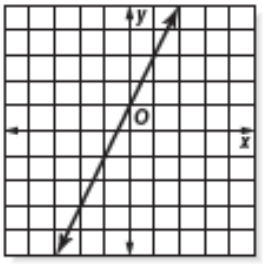
2. slope = $\frac{3}{5}$,
   y-intercept = 6

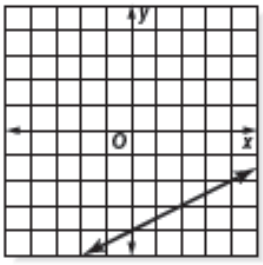
3. slope = −6,
   y-intercept = 7

4. slope = $\frac{2}{7}$,
   y-intercept = 1

5. slope = $\frac{4}{3}$,
   y-intercept = −4

6. 

7. 

8. 

Write an equation of the line in slope-intercept that passes through each pair of points.

9. (9, −1) and (6, −2)

10. (12, 5) and (−4, 1)

11. (10, −6) and (−2, −6)

12. (5, 0) and (2, −3)

13. (12, −2) and (6, 2)

14. (−5, 10) and (3, −6)

Foundations for Algebra I
Pre – Algebra Skills Reviews

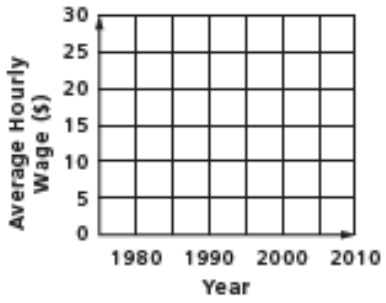
Prediction Equations

CONSTRUCTION For Exercises 1 and 2, use the table that shows the average hourly wage of U.S. construction workers from 1980 to 2005.

Year	Average Hourly Earnings ($)
1980	9.94
1985	12.32
1990	13.77
1995	15.09
2000	17.48
2005	19.46

Source: *The New York Times Almanac*

1. Make a scatter plot and draw a line of fit for the data.



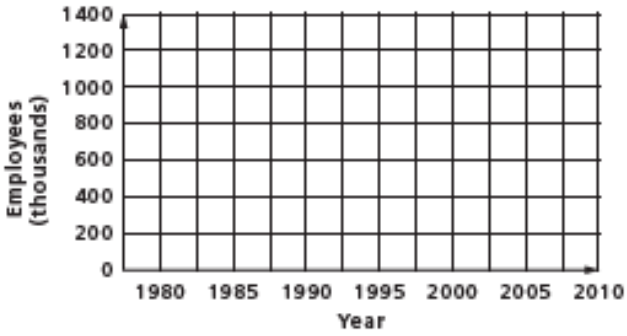
2. Use the line of fit to predict the average hourly wage of construction workers in 2010.

MINING For Exercises 3 and 4, use the table that shows the number of persons employed in mining from 1980 to 2005.

Year	Employees (thousands)
1980	1027
1985	927
1990	709
1995	581
2000	475
2005	318

Source: U.S. Census Bureau

3. Make a scatter plot and draw a line of fit for the data.

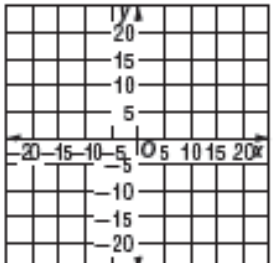


4. Write an equation for the line of fit and use it to predict the number of persons employed in mining in 2010.

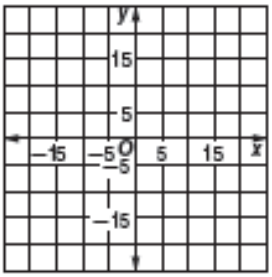
Foundations for Algebra I
Pre – Algebra Skills Reviews
Systems of Equations

Solve each system of equations by graphing.

1. $y = x - 9$
   $y = 2x + 4$



2. $\frac{1}{2}y = 4x - 6$
   $\frac{1}{4}y = 2x - 3$



Solve each system of equations by substitution.

3. $y = x - 8$
   $y = 1$

4. $y = x + 4$
   $y = 0$

5. $y = 3x + 10$
   $x = 5$

6. $y = 2x$
   $x = -4$

7. $16 = 4x - y$
   $y = 2x$

8. $26 = y + x$
   $y = x$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Powers and Exponents

Write each expression using exponents.

1. $7 \cdot 7$

2. $(-3)(-3)(-3)(-3)(-3)$

3. $p \cdot p \cdot p \cdot p \cdot p \cdot p$

4. $3 \cdot 3$

5. $8 \cdot 8 \cdot c \cdot c \cdot c \cdot c \cdot d \cdot d \cdot d$

6. $(-w)(-w)(v)(v)(v)(v)(v)$

Evaluate each expression if $a = -3$, $b = 8$, and $c = 2$.

7. 4^c

8. c^0

9. 3^c

10. c^4

11. $b^2 + c^3$

12. a^2

13. b^2a

14. $(b - c)^2$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Prime Factorization

Determine whether each number is *prime* or *composite*.

1. 41
2. 29
3. 57
4. 61
5. 39
6. 91

Write the prime factorization of each number. Use exponents for repeated factors.

7. 20
8. 40
9. 90
10. 121
11. 65
12. 80

Factor each monomial.

13. $15t$
14. $16r^2$
15. $21ab$
16. $-42xyz$
17. $27d^4$
18. $-16cd^2$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Multiplying and Dividing Monomials

Find each product or quotient. Express using exponents.

1. $2^3 \cdot 2^5$

2. $10^2 \cdot 10^7$

3. $(-3)^2(-3)^3$

4. $(-9)^2(-9)^2$

5. $11a^2 \cdot 3a^6$

6. $10t^2 \cdot 4t^{10}$

7. $\frac{5^{10}}{5^2}$

8. $\frac{10^6}{10^2}$

9. $\frac{100^9}{100^3}$

10. $\frac{(-2)^3}{-2}$

11. $\frac{q^8}{q^4}$

12. $\frac{g^{12}}{g^8}$

13. the product of two squared and two to the sixth power

14. the product of y squared and y cubed

Foundations for Algebra I
Pre – Algebra Skills Reviews

Negative Exponents

Write each expression using a positive exponent.

1. 3^{-4}
2. 8^{-7}
3. 10^{-4}
4. n^{-10}
5. b^{-8}
6. q^{-5}

Write each fraction as an expression using a negative exponent other than –1.

7. $\frac{1}{8^2}$
8. $\frac{1}{10^3}$
9. $\frac{1}{2^3}$
10. $\frac{1}{3^7}$
11. $\frac{1}{9^2}$
12. $\frac{1}{3^2}$

Evaluate each expression if $x = 1$, $y = 2$, and $z = -3$.

13. y^{-2}
14. z^{-2}
15. x^{-8}
16. z^{-4}
17. 5^z
18. x^{-99}

Foundations for Algebra I
Pre – Algebra Skills Reviews

Scientific Notation

Express each number in standard form.

1. 1.5×10^{3}
2. 4.01×10^{4}
3. 7.0×10^{8}
4. 9.99×10^{7}
5. 1.75×10^{4}
6. 1.2×10^{-6}
7. 5.83×10^{-2}
8. 8.075×10^{-4}

Express each number in scientific notation.

9. 0.00027
10. 5300
11. 17,000,000,000
12. 0.01
13. 0.0054
14. 0.000099

Choose the greater number in each pair.

15. 8.8×10^{3}, 9.1×10^{-4}
16. 5.01×10^{2}, 5.02×10^{-1}
17. 2.2×10^{-3}, 2.1×10^{2}
18. 8.4×10^{2}, 839

Order each set of numbers from least to greatest.

19. 3.6×10^{4}; 5.8×10^{-3}; 2.1×10^{6}; 3.5×10^{5}

Foundations for Algebra I
Pre – Algebra Skills Reviews

Powers of Monomials

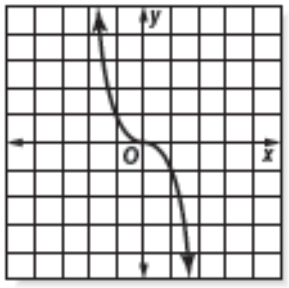
Simplify.

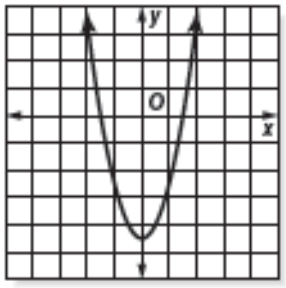
1. $(7^2)^9$
2. $(12^8)^5$
3. $(-15^6)^4$
4. $(90^5)^9$
5. $(-3^6)^5$
6. $(-b^3)^4$
7. $(11n^5)^3$
8. $(3p^{10})^5$
9. $(-5g^{-8})^4$
10. $(-8x^{-2}y^{-6})^3$
11. $(2g^2h^3)^8$
12. $(-3a^4b^3)^4$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Linear and Nonlinear Functions

Determine whether each graph, equation, or table represents a *linear* or *nonlinear* function. Explain.

1. 

2. 

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

4. $y = \frac{2}{x} + 10$

5. $y = 8x$

6. $y + 4x^2 - 1 = 0$

7. $2y - 8x + 11 = 0$

8. $y = \sqrt{3x} - 2$

9.

x	y
1	8
2	5
3	2
4	−1

10.

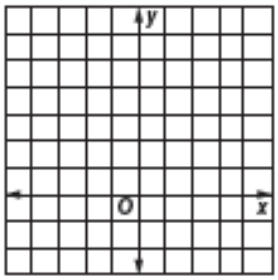
x	y
20	−4
15	2
10	0
5	2

Foundations for Algebra I
Pre – Algebra Skills Reviews

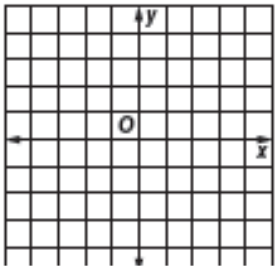
Quadratic Functions

Graph each function.

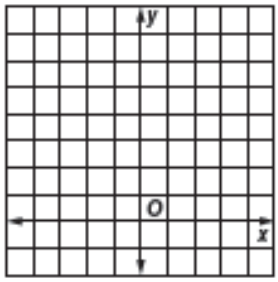
1. $y = 5x^2$



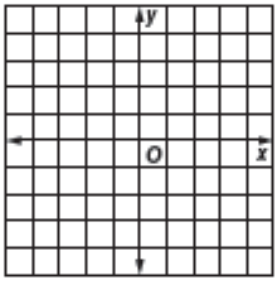
2. $y = -x^2$



3. $y = x^2 + 4$



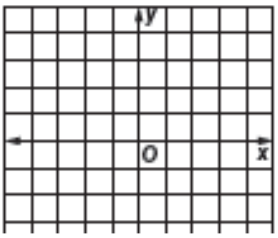
4. $y = -2x^2 + 2$



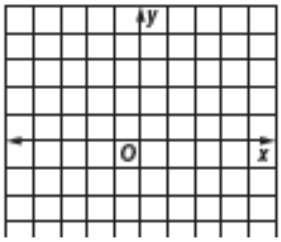
Foundations for Algebra I
Pre – Algebra Skills Reviews
Cubic and Exponential Functions

Graph each function.

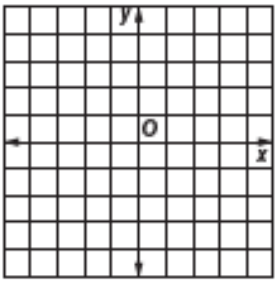
1. $y = 5x^3$



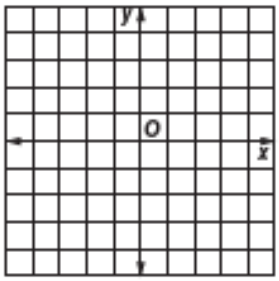
2. $y = -5x^3$



3. $y = 2x^3 + 3$



4. $y = -x^3$



Foundations for Algebra I
Pre – Algebra Skills Reviews

Squares and Square Roots

Find each square root.

1. $\sqrt{1}$
2. $\sqrt{9}$
3. $\sqrt{25}$
4. $-\sqrt{36}$
5. $\sqrt{-81}$
6. $-\sqrt{64}$
7. $\sqrt{225}$
8. $\sqrt{441}$
9. $\sqrt{625}$
10. $\sqrt{2.25}$
11. $\sqrt{0.16}$
12. $\sqrt{3.24}$
13. $\sqrt{31}$
14. $\sqrt{40}$
15. $\sqrt{94}$
16. $\sqrt{-521}$
17. $-\sqrt{314}$
18. $-\sqrt{902}$

Estimate each square root to the nearest integer. Do not use a calculator.

19. $\sqrt{38}$
20. $\sqrt{84}$
21. $\sqrt{389}$
22. $-\sqrt{83}$
23. $-\sqrt{19}$
24. $-\sqrt{119}$

Foundations for Algebra I
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The Real Number System

Name all of the sets of numbers to which each real number belongs. Let W = whole numbers, Z = integers, Q = rational numbers, and I = irrational numbers.

1. 12
2. 25
3. -5
4. $\sqrt{31}$
5. $\sqrt{7}$
6. $\frac{25}{3}$

Determine whether each statement is *sometimes*, *always*, or *never* true.

7. A whole number is a rational number.

8. A negative number is an integer.

Replace each ● with <, >, or = to make a true statement.

9. $-\sqrt{12}$ ● -3.5
10. $\sqrt{104.04}$ ● 10.2

Order each set of numbers from least to greatest.

11. $5\frac{1}{3}, 5.3, \sqrt{28}, 2\frac{1}{4}$

12. $-9.35, -\sqrt{72.75}, -9\frac{2}{10}, -9$

ALGEBRA Solve each equation. Round to the nearest tenth, if necessary.

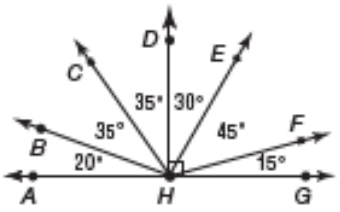
13. $a^2 = 64$
14. $d^2 = 169$
15. $f^2 = 441$
16. $b^2 = 4.41$
17. $y^2 = 0.36$
18. $m^2 = 0.0025$

Foundations for Algebra I
Pre – Algebra Skills Reviews

Triangles

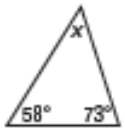
Classify each angle as *acute*, *obtuse*, *right*, or *straight*.

1. $\angle AHB$
2. $\angle AHD$
3. $\angle AHF$



Find the value of x in each triangle. Then classify each triangle by its angles and by its sides.

4.



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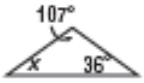

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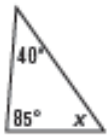
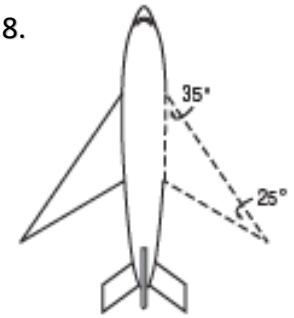


Classify each dashed triangle by its angles and by its sides.

7.

8.



Foundations for Algebra I
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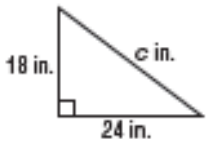
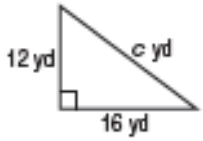
The Pythagorean Theorem

Find the length of the hypotenuse of each right triangle. Round to the nearest tenth, if necessary.

1. 

2. 

3. 

If c is the measure of the hypotenuse, find each missing measure. Round to the nearest tenth, if necessary.

4. $a = ?, b = 24, c = 26$

5. $a = 16, b = ?, c = 34$

6. $a = 8, b = ?, c = 12$

7. $a = 14, b = 21, c = ?$

The lengths of three sides of a triangle are given. Determine whether each triangle is a right triangle.

8. 14 m, 5 m, 4 m

9. 3 in., 4 in., 5 in.

Foundations for Algebra I
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The Distance Formula

Find the distance between each pair of points. Round to the nearest tenth, if necessary.

1. $A(2, 4), B(1, 3)$

2. $P(5, 10), Q(-1, 1)$

3. $M(-5, -5), N(3, -4)$

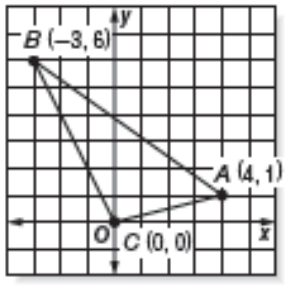
4. $V(4, 7), W(1, 6)$

5. $V(2, -6), W(4, -7)$

6. $C(6, 2), D(4, 7)$

GEOMETRY Classify each triangle by its sides. Then find the perimeter of each triangle. Round to the nearest tenth.

7.



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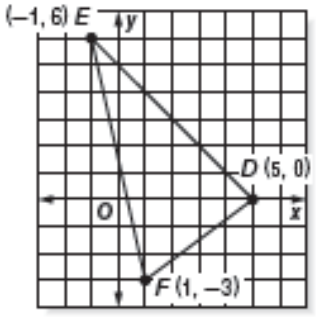

GEOMETRY The coordinates of the vertices of a triangle are given. Find the perimeter of each triangle. Round to the nearest tenth, if necessary.

9. $J(4, 5), K(-2, 2)$, and $L(-4, 4)$

10. $E(3, 5), F(4, 8)$, and $G(-1, 6)$

Foundations for Algebra I
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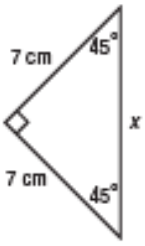
Special Right Triangles

Find each missing measure.

1.



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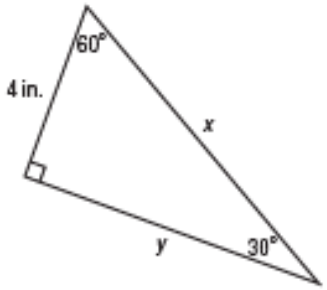

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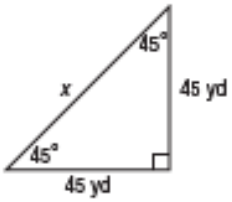

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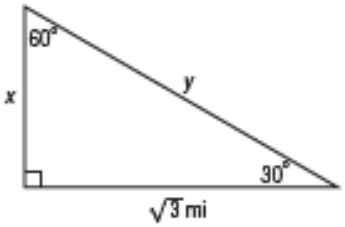

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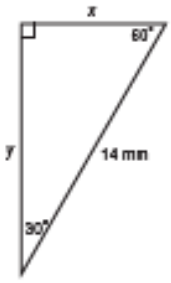

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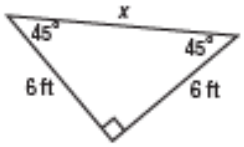

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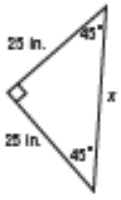

8.