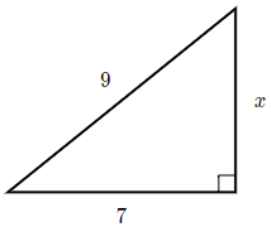
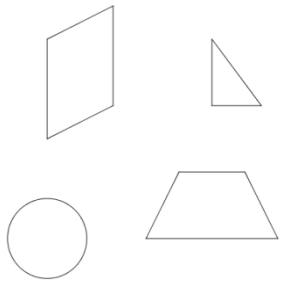
Prerequisite Skills for Geometry

- You should be able to do these problems without using a calculator.
- If you have questions, you can search the *italicized phrase(s)* in khanacademy.org.
- See Additional Problems on the following pages for more practice of each type.

Rewrite the square roots in the simplest form. $\sqrt{50}+3\sqrt{72}$ Keywords: *Simplifying square roots Simplifying square root, expressions: no variable* Additional Problems	**Find the value of *x*.** $4x-7=3$ Keywords: *Solving linear equations* Additional Problems	**Rewrite the fraction in its simplest form.** $\frac{4}{3/7}$ Keywords: *Simplifying complex fractions* Additional Problems
(a) Let *n*=5, solve for *A*. **(b) Let *A* = 90, solve for *n*.** $A=\frac{(n-2)180}{n}$ Keywords: *Solving equations: two-step equations* Additional Problems	**Factor.** $x^2+7x-18$ Keywords: *Factoring quadratics* Additional Problems	**Expand.** $(x-2)(3x+4)$ Keywords: *Multiplying binomials* Additional Problems
What is the slope of the line through points $(-6,5)$ and $(0,-7)$? Keywords: *Finding slope from two points* Additional Problems	**(a) Plot the four points on the coordinate axes.** $(-2,-1),(5,0),(4,7),(-3,6)$ **(b) What shape is formed?** Keywords: *Plotting a point* Additional Problems	**Graph the line on the coordinate axes.** $y=\frac{3}{2}x+4$ Keywords: *Graphing lines, Point slope form of a line* Additional Problems
Are the lines $y=-2x+3$ and $y=-2x-7$ parallel? Keywords: *Parallel lines from equation* Additional Problems	**Find the length of side *x*.**  Keywords: *Pythagorean theorem* Additional Problems	**Name of the following figures.**  Keywords: *Recognizing shapes* Additional Problems

Prerequisite Skills for Geometry - KEY

Simplifying square roots
Simplifying square root expressions: no variable

Rewrite the square roots in the simplest form.

$\sqrt{50}+3\sqrt{72}=23\sqrt{2}$

Solving linear equations

Find the value of *x*.

$4x-7=3$

$x=2.5$

Simplifying complex fractions

Rewrite the fraction in its simplest form.

$\frac{4}{\frac{3}{7}}=\frac{28}{3}$

Solving equations: two-step equations

(a) Let *n=5*, solve for *A*.

$A=108$

(b) Let *A* = 90, solve for *n*.

$n=4$

Factoring quadratics

Factor.

$x^2+7x-18=(x+9)(x-2)$

Multiplying binomials

Expand.

$(x-2)(3x+4)=3x^2-2x-8$

Finding slope from two points

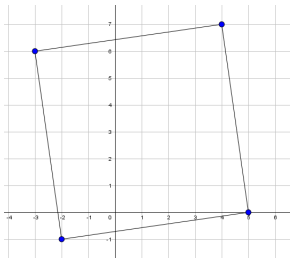
What is the slope of the line through points $(-6,5)$ **and** $(0,-7)$ **?**

Slope = $-\frac{1}{2}$

Plotting a point

(a) Plot the four points on the coordinate axes.

$(-2,-1),(5,0),(4,7),(-3,6)$

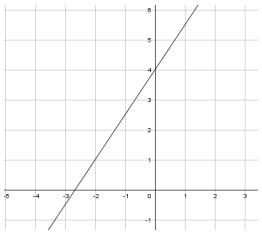


(b) What shape is formed?
Square

Graphing lines
Point slope form of a line

Graph the line on the coordinate axes.

$y=\frac{3}{2}x+4$



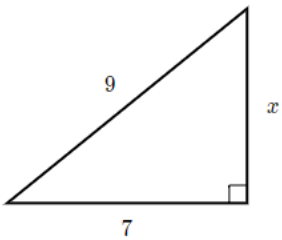
Parallel lines from equation

Are the lines $y=-2x+3$ **and** $y=-2x-7$ **parallel?**

Yes, because the slope of both lines is the same. The slope of the lines is -2.

Pythagorean theorem

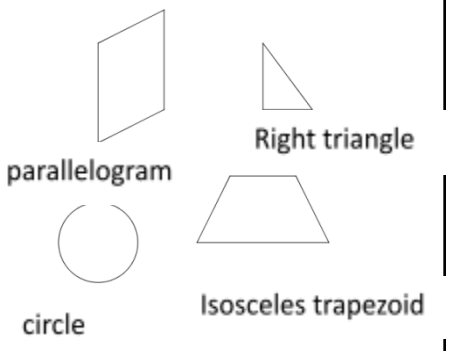
Find the length of side *x*.



x = 32

Recognizing shapes

Name of the following figures.



Simplify.

1) $\sqrt{8}+\sqrt{8}+\sqrt{8}$

2) $\sqrt{54}+\sqrt{8}+\sqrt{18}$

3) $\sqrt{54}+\sqrt{3}+\sqrt{3}$

4) $3\sqrt{7}-5\sqrt{7}$

5) $5\sqrt{2}+3\sqrt{2}$

6) $-2\sqrt{200}-2\sqrt{8}$

7) $5\sqrt{2}-3\sqrt{18}$

8) $2\sqrt{3}-5\sqrt{48}$

9) $\sqrt{6}\left(2+\sqrt{6}\right)$

10) $\sqrt{6}\left(3+\sqrt{3}\right)$

11) $\sqrt{10}\left(2-4\sqrt{2}\right)$

Simplify.

1) $\sqrt{8}+\sqrt{8}+\sqrt{8}$

$6\sqrt{2}$

2) $\sqrt{54}+\sqrt{8}+\sqrt{18}$

$3\sqrt{6}+5\sqrt{2}$

3) $\sqrt{54}+\sqrt{3}+\sqrt{3}$

$3\sqrt{6}+2\sqrt{3}$

4) $3\sqrt{7}-5\sqrt{7}$

$-2\sqrt{7}$

5) $5\sqrt{2}+3\sqrt{2}$

$8\sqrt{2}$

6) $-2\sqrt{200}-2\sqrt{8}$

$-24\sqrt{2}$

7) $5\sqrt{2}-3\sqrt{18}$

$-4\sqrt{2}$

8) $2\sqrt{3}-5\sqrt{48}$

$-18\sqrt{3}$

9) $\sqrt{6}(2+\sqrt{6})$

$2\sqrt{6}+6$

10) $\sqrt{6}(3+\sqrt{3})$

$3\sqrt{6}+3\sqrt{2}$

11) $\sqrt{10}(2-4\sqrt{2})$

$2\sqrt{10}-8\sqrt{5}$

Geometry

Solve each equation.

1) $3x + 5x = -8$

2) $8 - k - 5k = -10$

3) $x - 6 - 7x = 6$

4) $6n + 2 = -4 + 5n$

5) $m + 4 = 8m - 6m - 3$

6) $8r + 5 + 8 = 5r + 4$

7) $3m - 3(m + 6) = -16$

8) $-50 = -5(6 - 4x)$

9) $8(6p - 2) = -64$

10) $\frac{3}{2}b + \frac{3}{4}b = \frac{9}{10}$

11) $\frac{1}{6}x + 3x = \frac{19}{24}$

12) $1.9x - 2(4.2 - 1.2x) = -7.11$

Solve each equation.

1) $3x + 5x = -8$

$\{-1\}$

2) $8 - k - 5k = -10$

$\{3\}$

3) $x - 6 - 7x = 6$

$\{-2\}$

4) $6n + 2 = -4 + 5n$

$\{-6\}$

5) $m + 4 = 8m - 6m - 3$

$\{7\}$

6) $8r + 5 + 8 = 5r + 4$

$\{-3\}$

7) $3m - 3(m + 6) = -16$

No solution.

8) $-50 = -5(6 - 4x)$

$\{-1\}$

9) $8(6p - 2) = -64$

$\{-1\}$

10) $\frac{3}{2}b + \frac{3}{4}b = \frac{9}{10}$

$\left\{\frac{2}{5}\right\}$

11) $\frac{1}{6}x + 3x = \frac{19}{24}$

$\left\{\frac{1}{4}\right\}$

12) $1.9x - 2(4.2 - 1.2x) = -7.11$

$\{0.3\}$

Algebra 1 Name_____ ID: 1

Assignment

Date_____ Period____

Find each quotient.

1) $\dfrac{-\frac{11}{9}}{-\frac{3}{4}}$

2) $\dfrac{1\frac{3}{10}}{3}$

3) $\dfrac{-\frac{3}{5}}{4\frac{3}{8}}$

4) $\dfrac{2\frac{4}{5}}{\frac{5}{3}}$

5) $-3\frac{5}{8} \div -3\frac{1}{4}$

6) $2 \div 3\frac{4}{5}$

7) $-3\frac{2}{3} \div \frac{-1}{2}$

8) $\frac{13}{9} \div \frac{-2}{3}$

Simplify each expression.

9) $\dfrac{6r}{2r-3} + \dfrac{6}{3r-1}$

10) $\dfrac{6}{2} - \dfrac{2}{2x^2+8x}$

11) $\dfrac{4v}{3v-1} + \dfrac{5v}{v-5}$

12) $\dfrac{4}{r+5} + \dfrac{5r}{r+1}$

Algebra 1 Name_____ ID: 1

Assignment

Date_____ Period____

Find each quotient.

1) $\dfrac{-\frac{11}{9}}{-\frac{3}{4}}$ $\frac{44}{27}$

2) $\dfrac{1\frac{3}{10}}{3}$ $\frac{13}{30}$

3) $\dfrac{-\frac{3}{5}}{4\frac{3}{8}}$ $-\frac{24}{175}$

4) $\dfrac{2\frac{4}{5}}{\frac{5}{3}}$ $\frac{42}{25}$

5) $-3\frac{5}{8} \div -3\frac{1}{4}$ $\frac{29}{26}$

6) $2 \div 3\frac{4}{5}$ $\frac{10}{19}$

7) $-3\frac{2}{3} \div \frac{-1}{2}$ $\frac{22}{3}$

8) $\frac{13}{9} \div \frac{-2}{3}$ $-\frac{13}{6}$

Simplify each expression.

9) $\dfrac{6r}{2r-3} + \dfrac{6}{3r-1}$

$\dfrac{18r^2 + 6r - 18}{(2r-3)(3r-1)}$

10) $\dfrac{6}{2} - \dfrac{2}{2x^2 + 8x}$

$\dfrac{3x^2 + 12x - 1}{x(x+4)}$

11) $\dfrac{4v}{3v-1} + \dfrac{5v}{v-5}$

$\dfrac{19v^2 - 25v}{(v-5)(3v-1)}$

12) $\dfrac{4}{r+5} + \dfrac{5r}{r+1}$

$\dfrac{29r + 4 + 5r^2}{(r+5)(r+1)}$

Solving Equations

(1). For $A = \frac{bh}{2}$:

a). Let $b = 3, h = 5$. Find $A.$

b). Let $h = 4, A = 10$. Find $b.$

(2). For $A = \pi r^2$:

a). Let $r = 4$. Find A .

b). Let $A = 36\pi$. Find r .

(3). For $m = \frac{y-2}{x+3}$:

a). Let $(x, y) = (-4, -1)$. Find $m.$

b). Let $y = 10, m = 2$. Find x .

(4). For $V = \frac{4}{3}\pi r^3$:

a). Let $r = 3$. Find $V.$

b). Let $V = \frac{32\pi}{3}$. Find $r.$

(5). For $A = \frac{1}{2}(b_1 + b_2)h$:

a). Let $b_1 = 6, b_2 = 4, h = 2$. Find A.

b). Let $b_1 = 1, h = 5, A = 10$. Find b_2 .

(6). For $d = \sqrt{(x-5)^2 + (y+1)^2}$:

a). Let $(x, y) = (1, 2).$ Find $d.$

b). Let $x = 0, d = 13$. Find $y.$

Solving Equations

(1). For $A = \frac{bh}{2}$:

a). Let $b = 3, h = 5$. Find $A.$

7.5

b). Let $h = 4, A = 10$. Find $b.$

5

(2). For $A = \pi r^2$:

a). Let $r = 4$. Find A .

16π

b). Let $A = 36\pi$. Find r .

6

(3). For $m = \frac{y-2}{x+3}$:

a). Let $(x, y) = (-4, -1)$. Find $m.$

3

b). Let $y = 10, m = 2$. Find x .

1

(4). For $V = \frac{4}{3}\pi r^3$:

a). Let $r = 3$. Find $V.$

36π

b). Let $V = \frac{32\pi}{3}$. Find $r.$

2

(5). For $A = \frac{1}{2}(b_1 + b_2)h$:

a). Let $b_1 = 6, b_2 = 4, h = 2$. Find A.

10

b). Let $b_1 = 1, h = 5, A = 10$. Find b_2 .

3

(6). For $d = \sqrt{(x-5)^2 + (y+1)^2}$:

a). Let $(x, y) = (1, 2).$ Find $d.$

5

b). Let $x = 0, d = 13$. Find $y.$

11

Geometry

Factor each completely.

1) $n^2 + 4n - 12$

2) $p^2 + 5p - 50$

3) $n^2 - 2n - 48$

4) $x^2 + 16x + 63$

5) $n^2 - 13n + 30$

6) $r^2 - r - 12$

7) $5r^2 - 18r + 16$

8) $2r^2 - 17r + 30$

9) $7x^2 + 4x - 20$

10) $4x^2 - 23x - 6$

11) $8k^2 - 30k - 50$

12) $6n^2 - 15n$

Factor each completely.

1) $n^2 + 4n - 12$
$(n - 2)(n + 6)$

2) $p^2 + 5p - 50$
$(p - 5)(p + 10)$

3) $n^2 - 2n - 48$
$(n + 6)(n - 8)$

4) $x^2 + 16x + 63$
$(x + 7)(x + 9)$

5) $n^2 - 13n + 30$
$(n - 3)(n - 10)$

6) $r^2 - r - 12$
$(r + 3)(r - 4)$

7) $5r^2 - 18r + 16$
$(5r - 8)(r - 2)$

8) $2r^2 - 17r + 30$
$(2r - 5)(r - 6)$

9) $7x^2 + 4x - 20$
$(7x - 10)(x + 2)$

10) $4x^2 - 23x - 6$
$(x - 6)(4x + 1)$

11) $8k^2 - 30k - 50$
$2(k - 5)(4k + 5)$

12) $6n^2 - 15n$
$3n(2n - 5)$

Algebra 1 Name_____ ID: 1

Assignment

Date_____ Period____

Find each product.

1) $(7a - 7)(a - 3)$

2) $(5x - 8)(5x - 2)$

3) $(2p - 3)(2p + 5)$

4) $(3x - 6)(7x + 3)$

5) $6(p + 1)$

6) $4(3x + 2)$

7) $2(k^2 + 4k - 2)$

8) $2(2x^2 + 5x + 6)$

9) $(5x - 7)^2$

10) $(3p + 8)(3p - 8)$

11) $(3r - 6)(3r + 6)$

12) $(2n + 6)^2$

Algebra 1 Name_____ ID: 1

Assignment

Date_____ Period____

Find each product.

1) $(7a-7)(a-3)$

$7a^2-28a+21$

2) $(5x-8)(5x-2)$

$25x^2-50x+16$

3) $(2p-3)(2p+5)$

$4p^2+4p-15$

4) $(3x-6)(7x+3)$

$21x^2-33x-18$

5) $6(p+1)$

$6p+6$

6) $4(3x+2)$

$12x+8$

7) $2(k^2+4k-2)$

$2k^2+8k-4$

8) $2(2x^2+5x+6)$

$4x^2+10x+12$

9) $(5x-7)^2$

$25x^2-70x+49$

10) $(3p+8)(3p-8)$

$9p^2-64$

11) $(3r-6)(3r+6)$

$9r^2-36$

12) $(2n+6)^2$

$4n^2+24n+36$

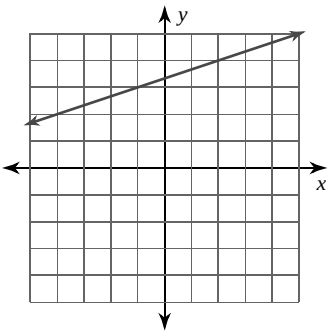
Algebra 1 Name_____ ID: 1

Assignment

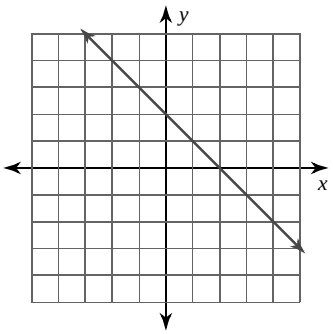
Date_____ Period____

Find the slope of each line.

1)



2)



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

3) $(17, -18), (19, -17)$

4) $(15, 2), (-15, 2)$

5) $(17, 17), (18, 10)$

6) $(7, -16), (7, 9)$

Find the slope of each line.

7) $y = -\frac{9}{2}x - 5$

8) $y = 8x - 3$

9) $-3y = -9 + 8x$

10) $0 = 10 + 2x + 5y$

11) $-2y = -x + 6$

12) $2 = -x$

Find the value of x or y so that the line through the points has the given slope.

13) $(x, -4)$ and $(-5, -1)$; slope: $-\frac{3}{2}$

14) $(x, -9)$ and $(-1, -8)$; slope: $-\frac{1}{4}$

15) $(-4, -8)$ and $(x, -1)$; slope: $\frac{7}{2}$

16) $(x, -4)$ and $(0, 6)$; slope: $-\frac{10}{7}$

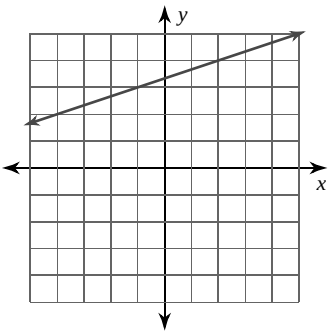
Algebra 1 Name_____ ID: 1

Assignment

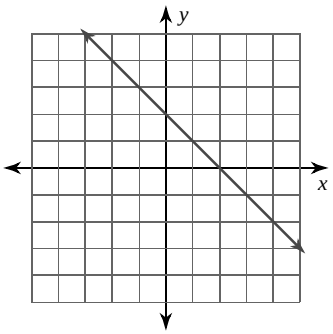
Date_____ Period____

Find the slope of each line.

1) $\frac{1}{3}$



2) -1



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

3) $(17, -18), (19, -17)$ $\frac{1}{2}$

4) $(15, 2), (-15, 2)$ 0

5) $(17, 17), (18, 10)$ -7

6) $(7, -16), (7, 9)$ Undefined

Find the slope of each line.

7) $y = -\frac{9}{2}x - 5$ $-\frac{9}{2}$

8) $y = 8x - 3$ 8

9) $-3y = -9 + 8x$ $-\frac{8}{3}$

10) $0 = 10 + 2x + 5y$ $-\frac{2}{5}$

11) $-2y = -x + 6$ $\frac{1}{2}$

12) $2 = -x$ Undefined

Find the value of x or y so that the line through the points has the given slope.

13) $(x, -4)$ and $(-5, -1)$; slope: $-\frac{3}{2}$ -3

14) $(x, -9)$ and $(-1, -8)$; slope: $-\frac{1}{4}$ 3

15) $(-4, -8)$ and $(x, -1)$; slope: $\frac{7}{2}$ -2

16) $(x, -4)$ and $(0, 6)$; slope: $-\frac{10}{7}$ 7

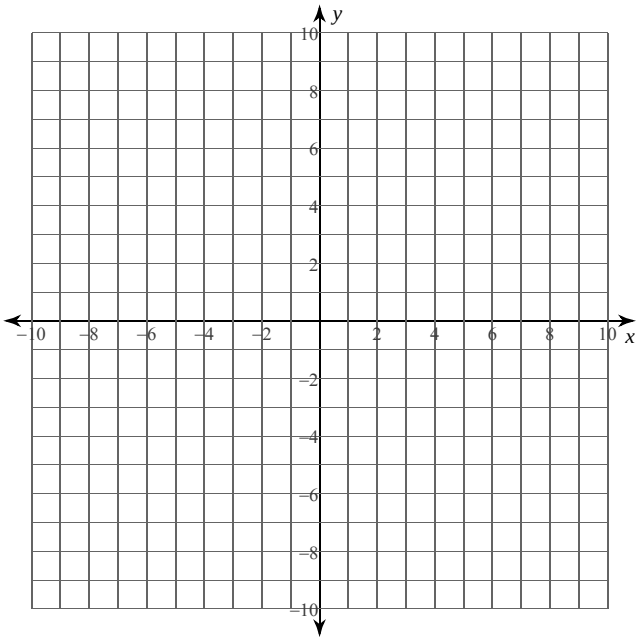
Geometry Name_____ ID: 1

Assignment

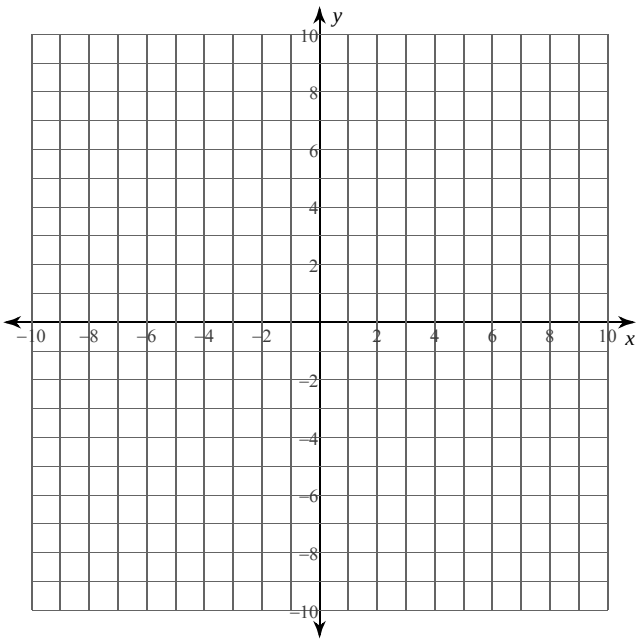
Date_____ Period____

Plot each point.

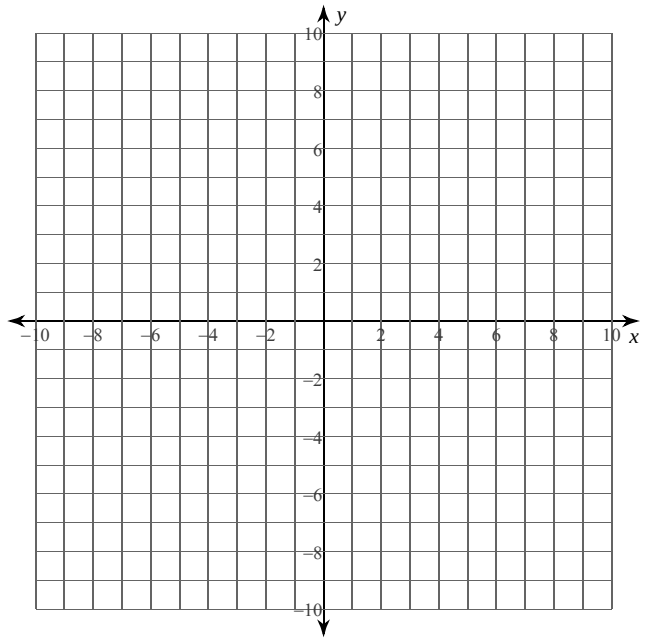
1) $M(1, 0)$ $L(-6, 3)$ $K(-1, -6)$



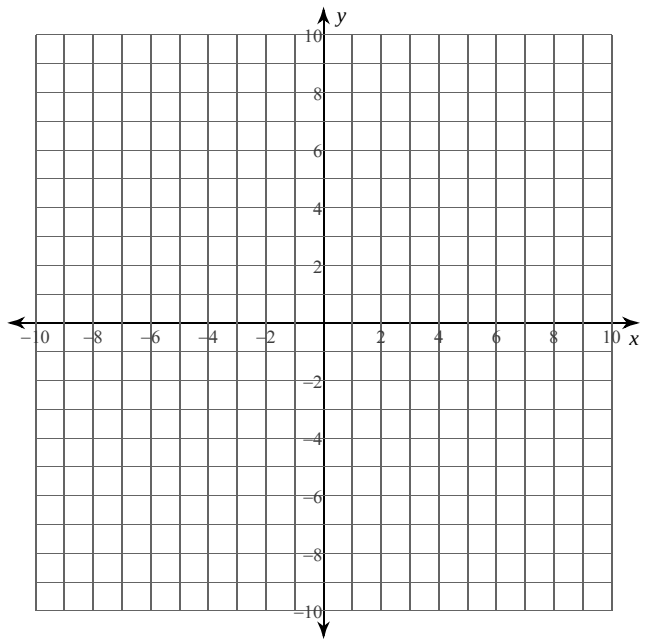
2) $L(9, 0)$ $M(2, 10)$ $N(-8, -7)$



3) $P(-4, -4)$ $Q(5, 9)$ $R(-9, -5)$

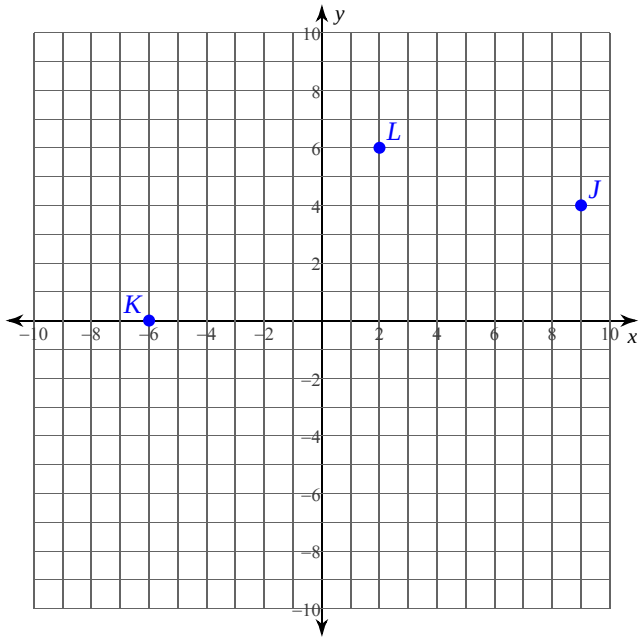


4) $F(1, -9)$ $G(5, -4)$ $H(9, -7)$

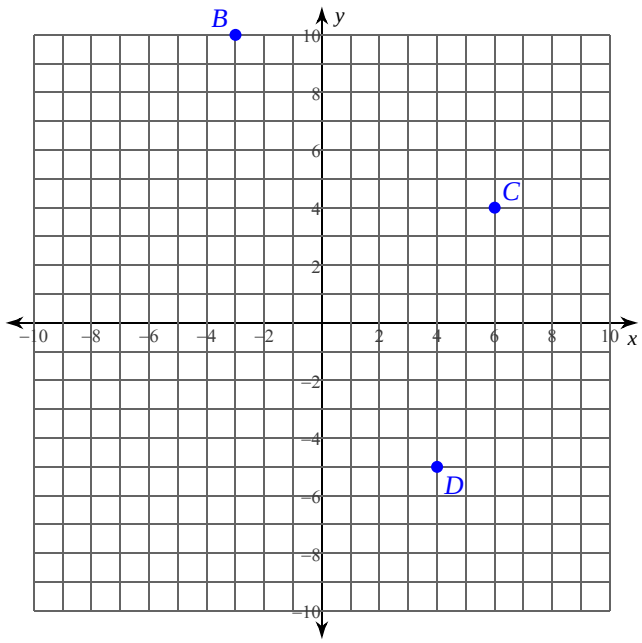


State the coordinates of each point.

5)

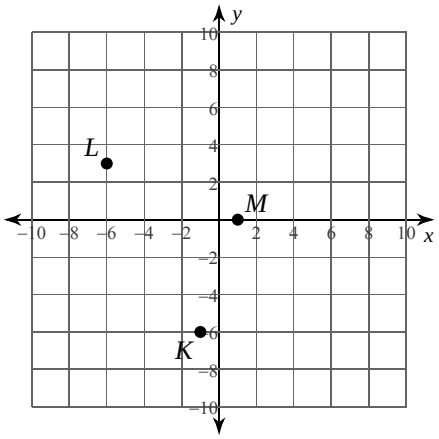


6)

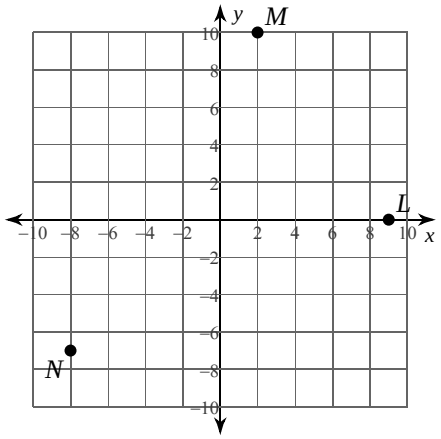


Answers to Assignment (ID: 1)

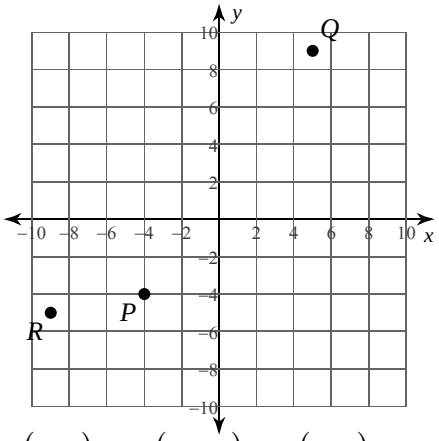
1)



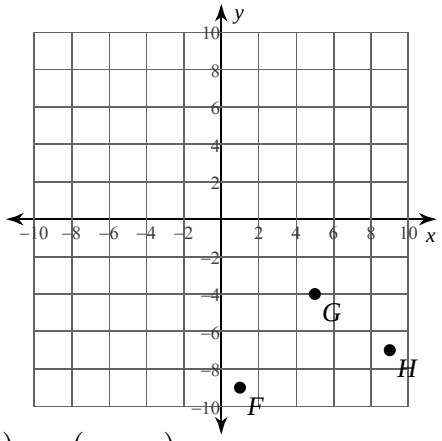
2)



3)



4)



5) $J(9, 4)$ $K(-6, 0)$ $L(2, 6)$ 6) $D(4, -5)$ $C(6, 4)$ $B(-3, 10)$

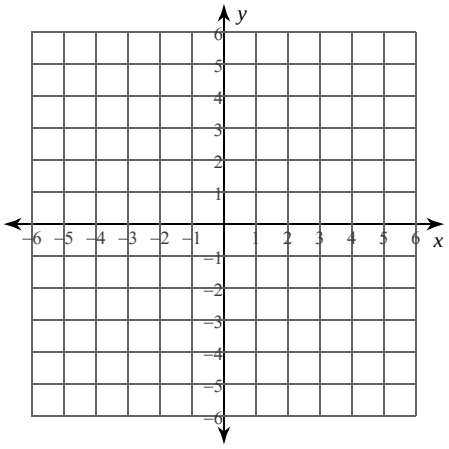
Algebra 1 Name_____ ID: 1

Assignment

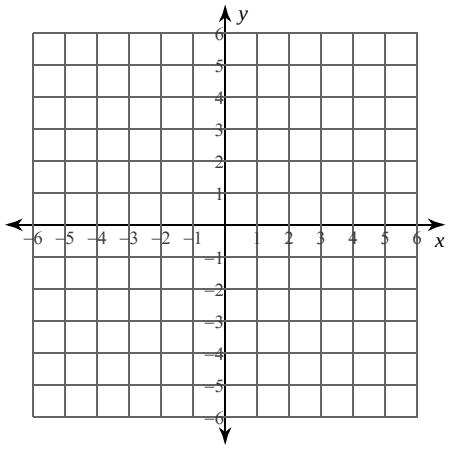
Date_____ Period____

Sketch the graph of each line.

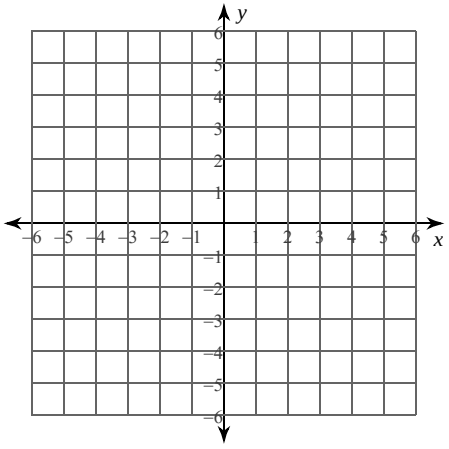
1) $y = -x - 3$



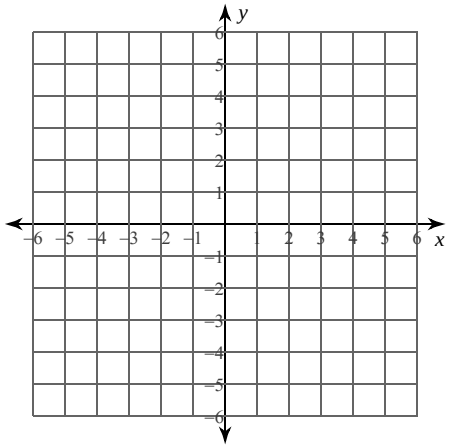
2) $y = -\frac{7}{2}x - 5$



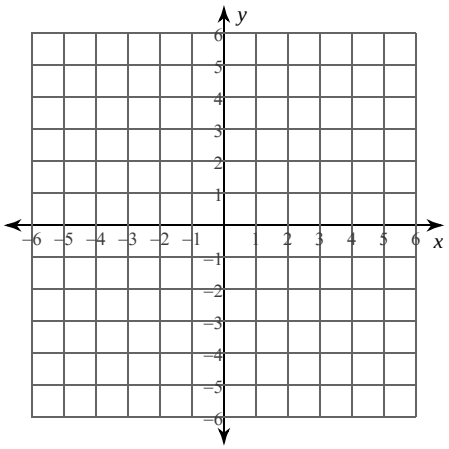
3) $y = x$



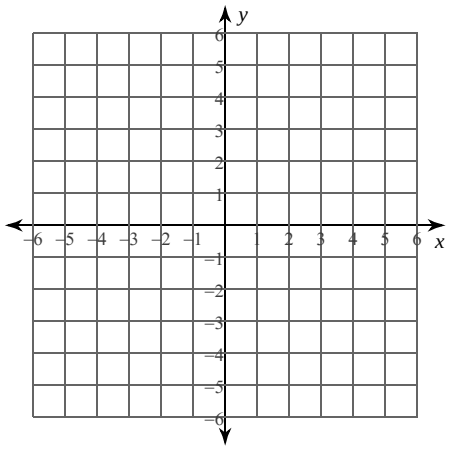
4) $y = \frac{1}{5}x - 2$



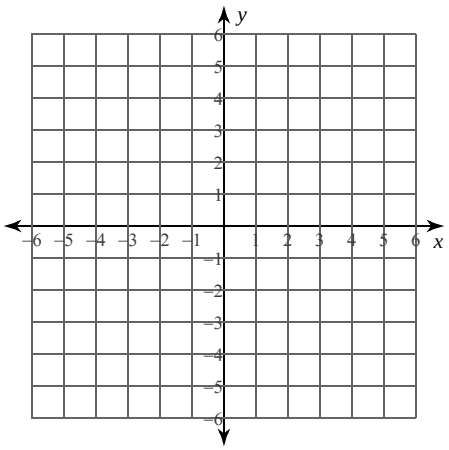
5) $0 = 2 - y$



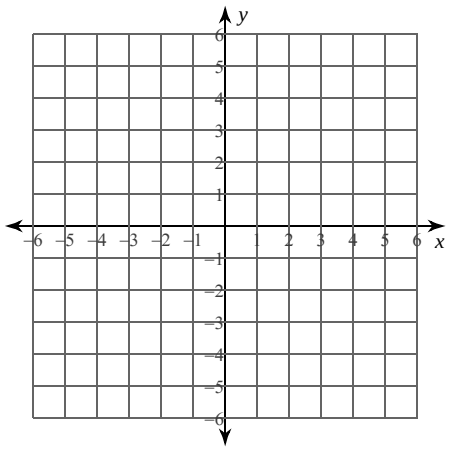
6) $x - y = -4$



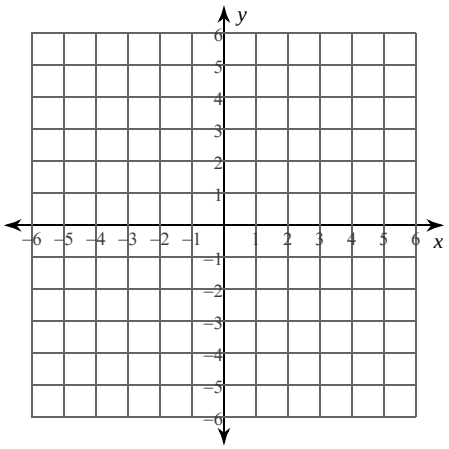
7) $0 = 6 - 2y - x$



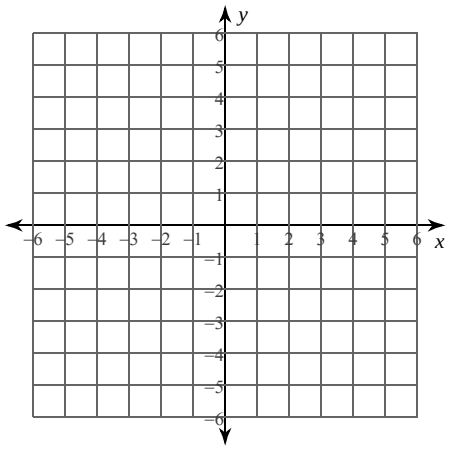
8) $0 = -3x - 9$



9) x-intercept = –5, y-intercept = –4



10) x-intercept = –4, y-intercept = 2



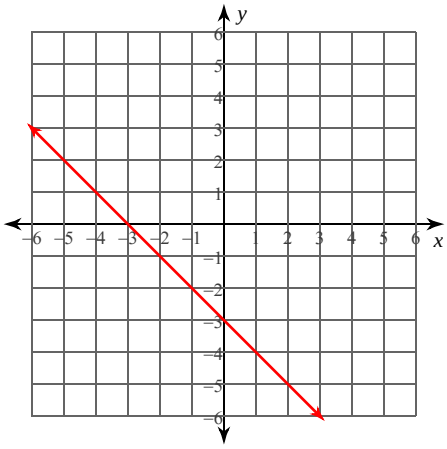
Algebra 1 Name_____ ID: 1

Assignment

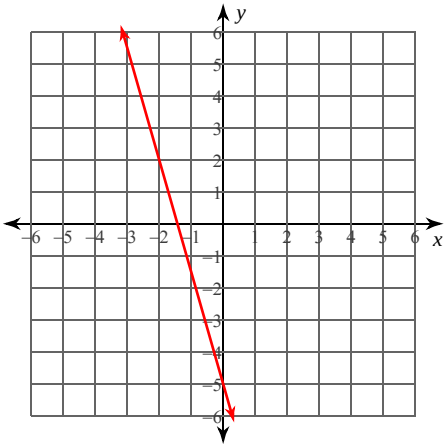
Date_____ Period____

Sketch the graph of each line.

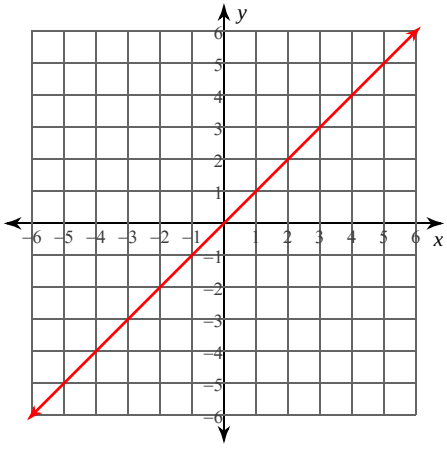
1) $y = -x - 3$



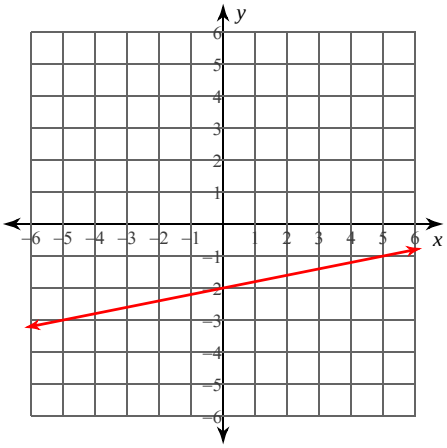
2) $y = -\frac{7}{2}x - 5$



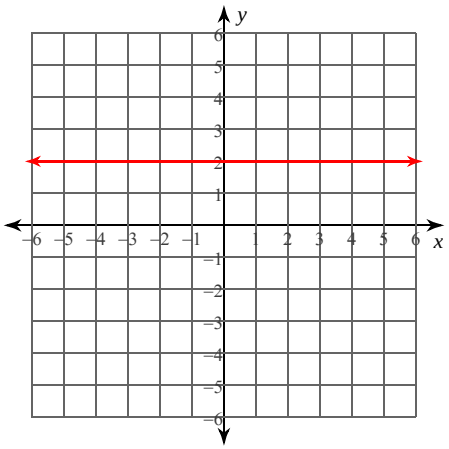
3) $y = x$



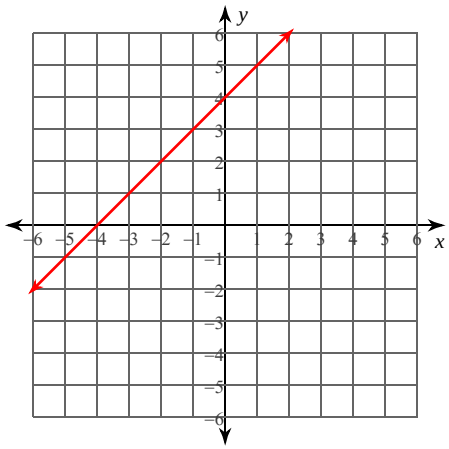
4) $y = \frac{1}{5}x - 2$



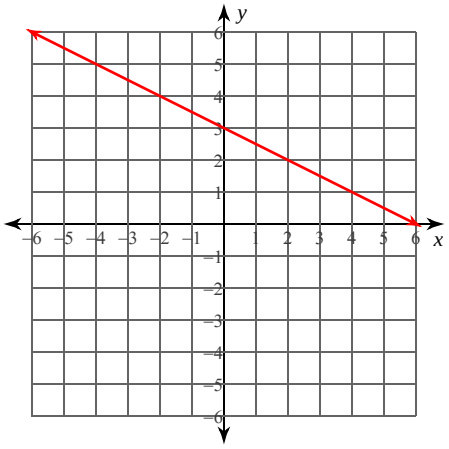
5) $0 = 2 - y$



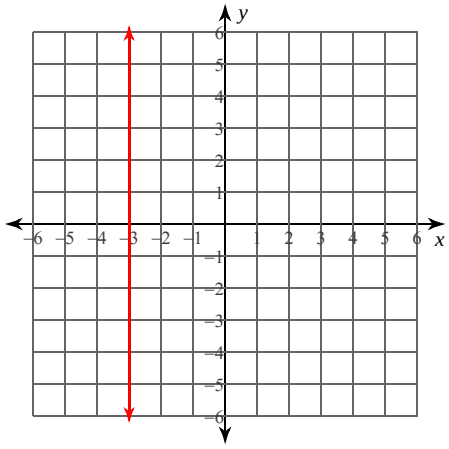
6) $x - y = -4$



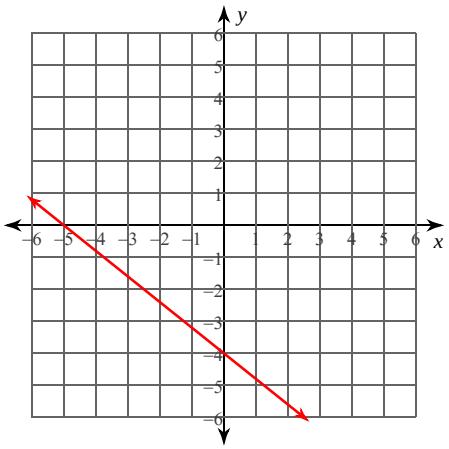
7) $0 = 6 - 2y - x$



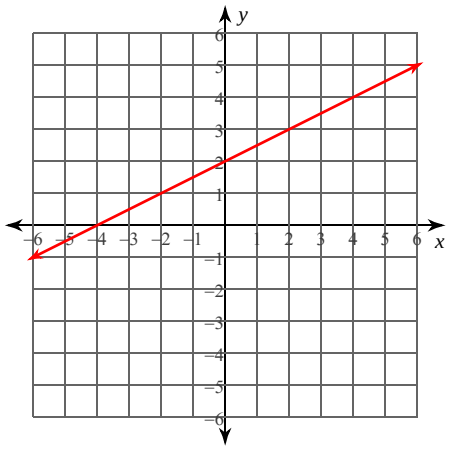
8) $0 = -3x - 9$



9) x-intercept = –5, y-intercept = –4



10) x-intercept = –4, y-intercept = 2



Algebra 1 Name_____ ID: 1

Assignment

Date_____ Period____

Find the slope of a line parallel to each given line.

1) $y = \frac{7}{4}x + 2$

2) $y = -x - 1$

3) $y = \frac{3}{2}x - 4$

4) $x = 1$

Find the slope of a line perpendicular to each given line.

5) $x = 4$

6) $y = x + 2$

7) $y = -\frac{5}{4}x$

8) $y = -\frac{2}{5}x + 4$

Find the slope of a line parallel to each given line.

9) $y - 1 = 5x$

10) $-1 = -y - x$

Find the slope of a line perpendicular to each given line.

11) $3y - 15 = 0$

12) $0 = 4y - x$

Algebra 1 Name_____ ID: 1

Assignment

Date_____ Period____

Find the slope of a line parallel to each given line.

1) $y = \frac{7}{4}x + 2$ $\frac{7}{4}$

2) $y = -x - 1$ -1

3) $y = \frac{3}{2}x - 4$ $\frac{3}{2}$

4) $x = 1$ Undefined

Find the slope of a line perpendicular to each given line.

5) $x = 4$ 0

6) $y = x + 2$ -1

7) $y = -\frac{5}{4}x$ $\frac{4}{5}$

8) $y = -\frac{2}{5}x + 4$ $\frac{5}{2}$

Find the slope of a line parallel to each given line.

9) $y - 1 = 5x$ 5

10) $-1 = -y - x$ -1

Find the slope of a line perpendicular to each given line.

11) $3y - 15 = 0$ Undefined

12) $0 = 4y - x$ -4

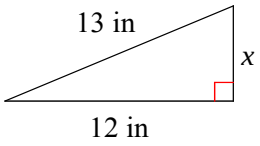
Geometry Name_____ ID: 1

Assignment

Date_____ Period____

Find the missing side of each triangle. Round your answers to the nearest tenth if necessary.

1)



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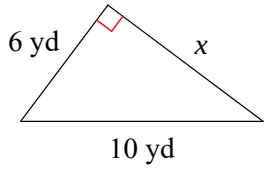

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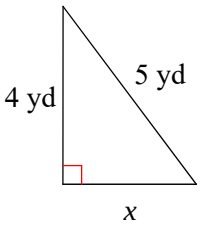
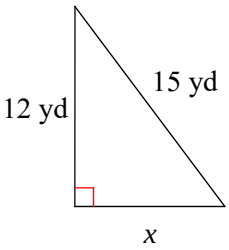
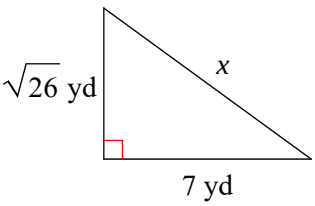


4)



Find the missing side of each triangle. Leave your answers in simplest radical form.

5)



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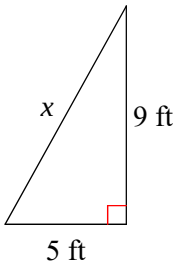
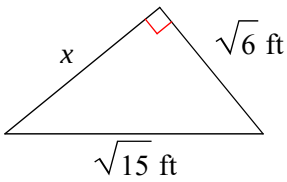
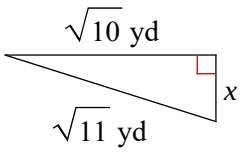


7)



8)



Answers to Assignment (ID: 1)

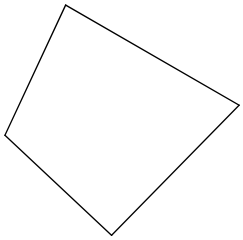
1) 5 in
2) 8 yd
3) 3 yd
4) 9 yd
5) $5\sqrt{3}$ yd
6) $\sqrt{106}$ ft
7) 3 ft
8) 1 yd

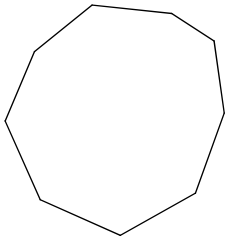
Geometry Name_____ ID: 1

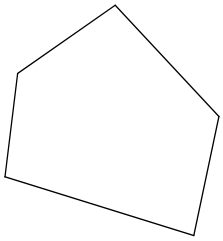
Assignment

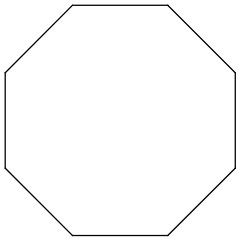
Date_____ Period____

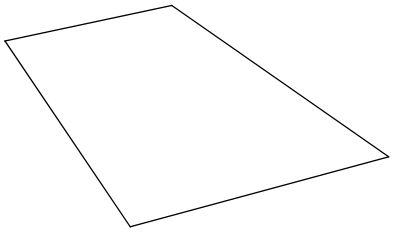
Write the name of each polygon.

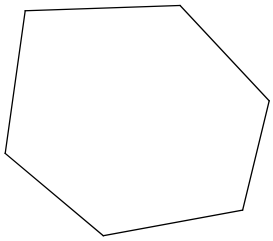
1) 

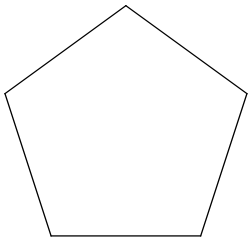
2) 

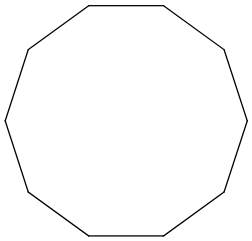
3) 

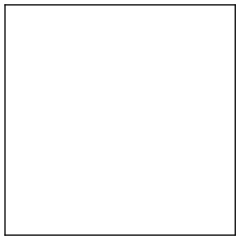
4) 

5) 

6) 

7) 

8) 

9) 

Answers to Assignment (ID: 1)

1) quadrilateral
2) nonagon
3) pentagon
4) octagon
5) quadrilateral
6) hexagon
7) pentagon
8) decagon
9) quadrilateral