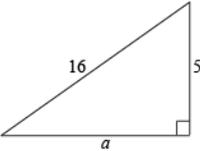
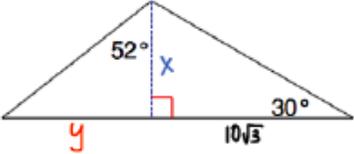
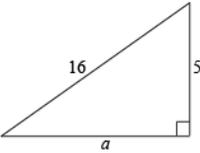
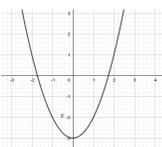
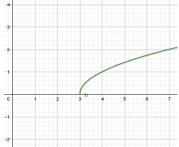
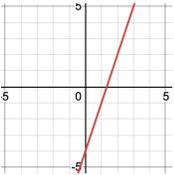


Prerequisite Skills for Precalculus

- 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.

<p>Simplify.</p> $\frac{\frac{1}{2}(4)^{\frac{3}{2}}}{\frac{2}{3}(16)^{\frac{1}{4}}}$ <p>Keywords: <i>simplifying rational exponents</i> Additional Problems</p>	<p>Write the domain in interval notation.</p> $y = \frac{1}{x-3}$ <p>Keywords: <i>finding domain of rational functions</i> Additional Problems</p>	<p>Find the equation of the line going through the following points in point-slope form $(3,-2)$ and $(1,5)$.</p> <p>Keywords: <i>point-slope form of a line</i> Additional Problems</p>
<p>Simplify.</p> $\frac{3\sqrt{18} + 2\sqrt{8}}{5\sqrt{50}}$ <p>Keywords: <i>simplifying radical expressions</i> Additional Problems</p>	<p>Simplify.</p> $1 + \frac{1}{x}$ $1 - \frac{1}{x}$ <p>Keywords: <i>simplifying rational expressions</i> Additional Problems</p>	<p>Solve for a.</p>  <p>Keywords: <i>Pythagorean theorem</i> Additional Problems</p>
<p>Simplify.</p> $\frac{(a^2b^{-2}c)^3}{(a^{-1}b)(b^2c)}$ <p>Keywords: <i>simplifying rational expressions with exponents</i> Additional Problems</p>	<p>Solve for x without a calculator, then solve for y with a calculator.</p>  <p>Keywords: <i>special triangles and right triangle trigonometry</i> Additional Problems</p>	<p>Solve for x and y.</p> $3x + y = -14$ $4x + 3y = -22$ <p>Keywords: <i>systems of equations</i> Additional Problems</p>
<p>Solve for a.</p> $2ab + 3b = 8a$ <p>Keywords: <i>isolate a variable</i> Additional Problems</p>	<p>Graph the following functions:</p> <p>a) $y = x^2 - 3$</p> <p>b) $y = \sqrt{x-3}$</p> <p>c) $y = 3x - 4$</p> <p>Keywords: <i>graphing quadratic, radical and linear equations</i> Additional Problems</p>	<p>Solve by factoring.</p> $2x^2 - 21x + 40 = 0$ <p>Keywords: <i>factoring quadratic equations</i> Additional Problems</p>

Prerequisite Skills for Precalculus - KEY

<p>Simplify.</p> $\frac{\frac{1}{2}(4)^{\frac{3}{2}}}{\frac{2}{3}(16)^{\frac{1}{4}}}$ <p>=3</p> <p>Keywords: <i>simplifying rational exponents</i> Additional Problems</p>	<p>Write the domain in interval notation.</p> $y = \frac{1}{x-3}$ <p>Domain: $(-\infty, 3), (3, \infty)$</p> <p>Keywords: finding domain of rational functions Additional Problems</p>	<p>Find the equation of the line going through the following points in point-slope form $(3, -2)$ and $(1, 5)$.</p> $y + 2 = -3.5(x - 3)$ $y - 5 = -3.5(x - 1)$ <p>Keywords: point-slope form of a line Additional Problems</p>
<p>Simplify.</p> $\frac{3\sqrt{18} + 2\sqrt{8}}{5\sqrt{50}}$ $= \frac{13}{25}$ <p>Keywords: simplifying radical expressions Additional Problems</p>	<p>Simplify.</p> $1 + \frac{1}{x}$ $1 - \frac{1}{x} = \frac{x+1}{x-1}$ <p>Keywords: simplifying rational expressions Additional Problems</p>	<p>Solve for a.</p>  $a = \sqrt{231}$ <p>Keywords: Pythagorean theorem Additional Problems</p>
<p>Simplify.</p> $\frac{(a^2b^{-2}c)^3}{(a^{-1}b)(b^2c)}$ $\frac{a^7c^2}{b^9}$ <p>Keywords: simplifying rational expressions with exponents Additional Problems</p>	<p>Solve for x without a calculator, then solve for y with a calculator.</p>  $x = 10, y = 12.799$ <p>Keywords: special triangles and right triangle trigonometry Additional Problems</p>	<p>Solve for x and y.</p> $3x + y = -14$ $4x + 3y = -22$ $x = -4, y = -2$ <p>Keywords: systems of equations Additional Problems</p>
<p>Solve for a.</p> $2ab + 3b = 8a$ $a = \frac{3b}{8-2b}$ <p>Keywords: isolate a variable Additional Problems</p>	<p>Graph the following functions:</p> <p>a) $y = x^2 - 3$ b) $y = \sqrt{x-3}$</p>   <p>c) $y = 3x - 4$</p>  <p>Keywords: graphing quadratic, radical and linear equations</p>	<p>Solve by factoring.</p> $2x^2 - 21x + 40 = 0$ $x = 2.5, 8$ <p>Keywords: factoring quadratic equations Additional Problems</p>

Simplify. Your answer should contain only positive exponents.

1)
$$\frac{x^{-1}y^3}{2y^2 \cdot (2yx^{-3})^3}$$

2)
$$\left(\frac{(x^2y^{-4})^4 \cdot x^{-2}}{x^{-1}y^4} \right)^2$$

3)
$$\left(\frac{u^{-4}v^{-2}}{uvv^3} \right)^3$$

4)
$$\frac{2yx^2 \cdot x^{-1}y^4 \cdot x^2}{(2x^4)^{-4}}$$

5)
$$\frac{2nm^{-2} \cdot m^{-1}n^{-2}}{(m^2n^4)^4}$$

6)
$$\left(\frac{(x^{-3}y^{-4})^4}{2y^3 \cdot xy} \right)^3$$

7)
$$\left(\frac{2u^{-1}v^2 \cdot 2uv^4}{(2v^4)^2} \right)^2$$

8)
$$\frac{(a^2 \cdot a^{-3}b^2)^3}{2a^{-2}b^3}$$

Answers to

$$1) \frac{x^8}{16y^2}$$

$$5) \frac{2}{m^{11}n^{17}}$$

$$2) \frac{x^{14}}{y^{40}}$$

$$6) \frac{1}{8x^{39}y^{60}}$$

$$3) \frac{1}{u^{15}v^{18}}$$

$$7) \frac{1}{v^4}$$

$$4) 32x^{19}y^5$$

$$8) \frac{b^3}{2a}$$

Finding Domain

Name _____

Identify the domain and range of each.

1) $y = \sqrt{x} - 2$

2) $y = \frac{3}{5}\sqrt{x}$

3) $y = \sqrt{x + 2}$

4) $y = \sqrt{x - 1} + 2$

5) $y = \sqrt{x - 3}$

6) $y = \sqrt{x + 6}$

Answers to

- 1) Domain: $x \geq 0$
Range: $y \geq -2$
- 5) Domain: $x \geq 3$
Range: $y \geq 0$

- 2) Domain: $x \geq 0$
Range: $y \geq 0$
- 6) Domain: $x \geq -6$
Range: $y \geq 0$

- 3) Domain: $x \geq -2$
Range: $y \geq 0$

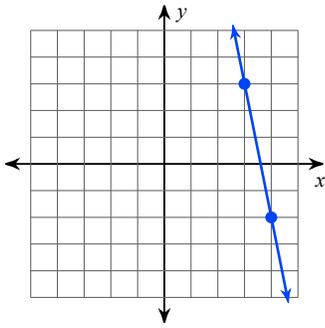
- 4) Domain: $x \geq 1$
Range: $y \geq 2$

Finding Lines

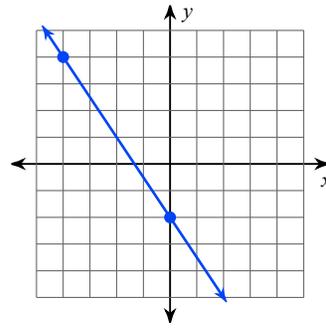
Name _____

Find the slope of each line.

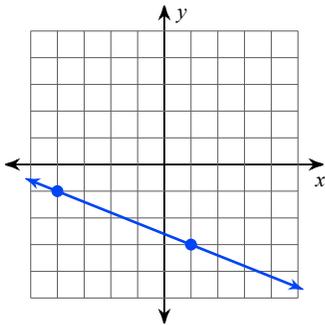
1)



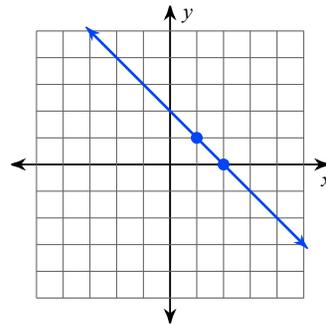
2)



3)



4)



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

5) $(-19, 12), (10, -17)$

6) $(4, 5), (18, -10)$

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

8) $(0, 6), (10, 10)$

Answers to

1) -5

2) $-\frac{3}{2}$

3) $-\frac{2}{5}$

4) -1

5) -1

6) $-\frac{15}{14}$

7) Undefined

8) $\frac{2}{5}$

Simplifying Radical Expressions

Name _____

Simplify.

1) $-\sqrt{6} + 3\sqrt{20} + 3\sqrt{6}$

2) $3\sqrt{8} - 3\sqrt{24} - 3\sqrt{54}$

3) $3\sqrt{54} + 3\sqrt{6} - 2\sqrt{54}$

4) $3\sqrt{8} - 3\sqrt{12} + 2\sqrt{12}$

5) $\frac{3\sqrt{5}}{\sqrt{45}}$

6) $\frac{5\sqrt{8}}{\sqrt{9}}$

7) $\frac{\sqrt{5}}{2\sqrt{80}}$

8) $\frac{4\sqrt{20}}{5\sqrt{9}}$

9) $\sqrt[3]{-135p^5}$

10) $\sqrt[3]{-512m}$

11) $\sqrt{175m^2}$

12) $\sqrt{12a^4}$

Answers to

1) $2\sqrt{6} + 6\sqrt{5}$

5) 1

9) $-3p\sqrt[3]{5p^2}$

2) $6\sqrt{2} - 15\sqrt{6}$

6) $\frac{10\sqrt{2}}{3}$

10) $-8\sqrt[3]{m}$

3) $6\sqrt{6}$

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

11) $5m\sqrt{7}$

4) $6\sqrt{2} - 2\sqrt{3}$

8) $\frac{8\sqrt{5}}{15}$

12) $2a^2\sqrt{3}$

Simplifying Rational Expressions

Name _____

Simplify each expression.

1)
$$\frac{\frac{x}{8} + \frac{1}{x}}{\frac{4}{x^2}}$$

2)
$$\frac{\frac{2}{x^2}}{\frac{2}{3} + \frac{1}{3}}$$

3)
$$\frac{\frac{x^2}{25} - \frac{25}{x^2}}{\frac{25}{x}}$$

4)
$$\frac{\frac{2}{25} + \frac{25}{4}}{\frac{2}{u}}$$

Simplify each and state the excluded values.

5)
$$\frac{18r - 45}{54r^2}$$

6)
$$\frac{4b^2 + 20b}{b + 5}$$

7)
$$\frac{v + 9}{3v + 27}$$

8)
$$\frac{x + 2}{9x^2 + 18x}$$

Answers to

$$1) \frac{x^3 + 8x}{32}$$

$$2) \frac{2}{x^2}$$

$$3) \frac{x^4 - 625}{625x}$$

$$4) \frac{633u}{200}$$

$$5) \frac{2r - 5}{6r^2}; \{0\}$$

$$6) 4b; \{-5\}$$

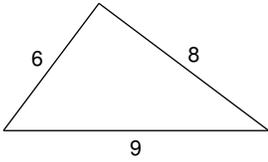
$$7) \frac{1}{3}; \{-9\}$$

$$8) \frac{1}{9x}; \{0, -2\}$$

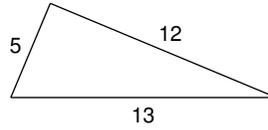
The Pythagorean Theorem

Do the following lengths form a right triangle?

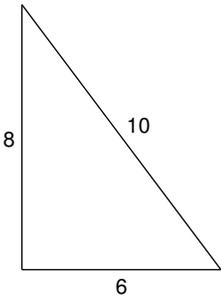
1)



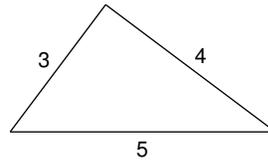
2)



3)

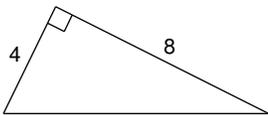


4)

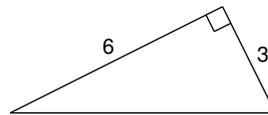
5) $a = 6.4$, $b = 12$, $c = 12.2$ 6) $a = 2.1$, $b = 7.2$, $c = 7.5$

Find each missing length to the nearest tenth.

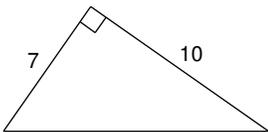
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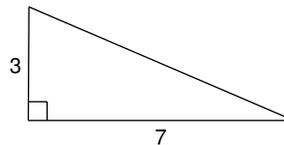
8)



9)



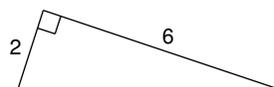
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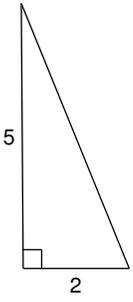
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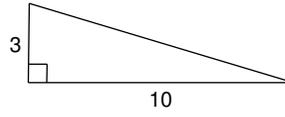
12)



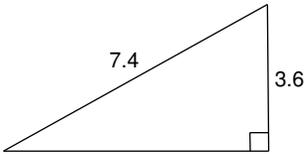
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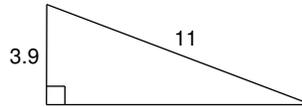
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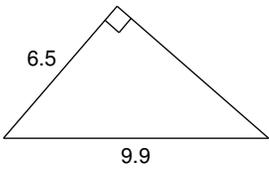
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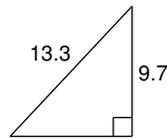
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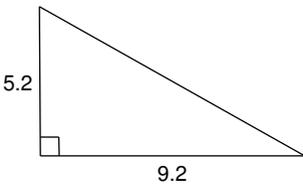
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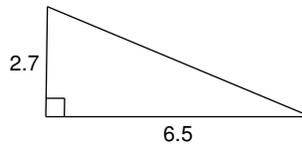
18)



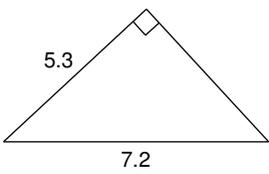
19)



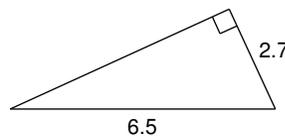
20)



21)



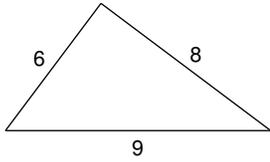
22)



The Pythagorean Theorem

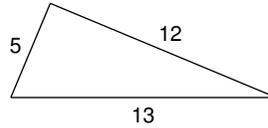
Do the following lengths form a right triangle?

1)



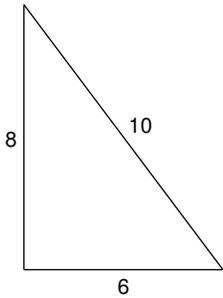
No

2)



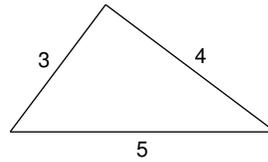
Yes

3)



Yes

4)



Yes

5) $a = 6.4$, $b = 12$, $c = 12.2$

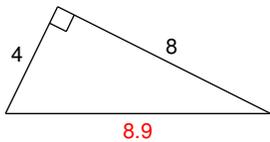
No

6) $a = 2.1$, $b = 7.2$, $c = 7.5$

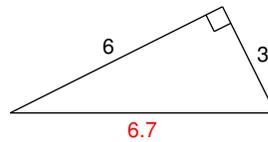
Yes

Find each missing length to the nearest tenth.

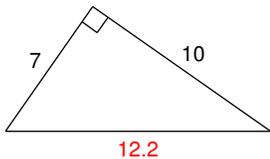
7)



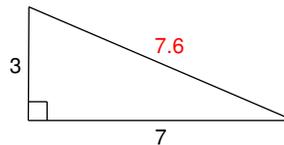
8)



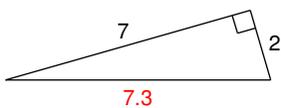
9)



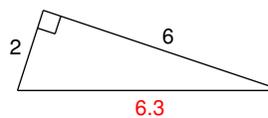
10)



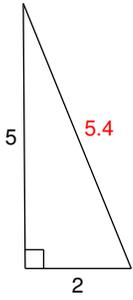
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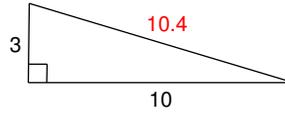
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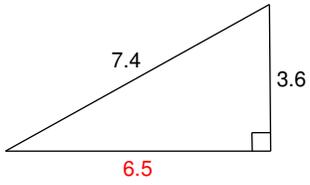
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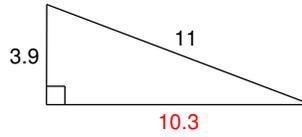
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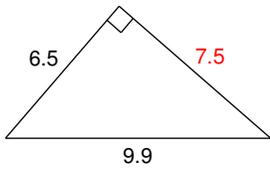
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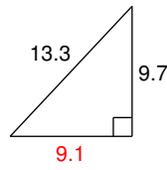
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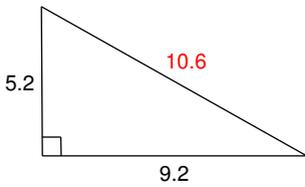
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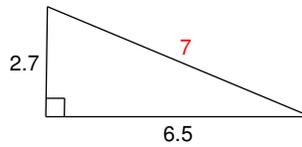
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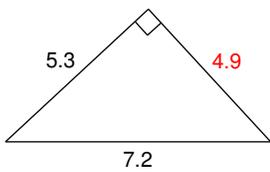
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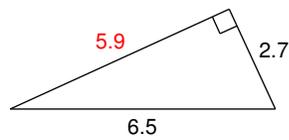
20)



21)



22)



Simplifying Rational Expressions with Exponents

Name _____

Simplify each expression.

1)
$$\frac{\frac{x}{8} + \frac{1}{x}}{\frac{4}{x^2}}$$

2)
$$\frac{\frac{2}{x^2}}{\frac{2}{3} + \frac{1}{3}}$$

3)
$$\frac{\frac{x^2}{25} - \frac{25}{x^2}}{\frac{25}{x}}$$

4)
$$\frac{\frac{2}{25} + \frac{25}{4}}{\frac{2}{u}}$$

Simplify each and state the excluded values.

5)
$$\frac{18r - 45}{54r^2}$$

6)
$$\frac{4b^2 + 20b}{b + 5}$$

7)
$$\frac{v + 9}{3v + 27}$$

8)
$$\frac{x + 2}{9x^2 + 18x}$$

Simplify. Your answer should contain only positive exponents.

9)
$$\frac{b^3 \cdot a^{-4} b^3}{4a^{-3} b^4}$$

10)
$$\frac{2x^{-1} y^{-1}}{x^4 \cdot 3y^3}$$

11)
$$\frac{3mn^3 \cdot 2m^{-1} n^2}{3nm^{-2}}$$

12)
$$\frac{x^4 y^3 \cdot 2x^{-2} y^{-4} \cdot 3xy^4}{3y^{-2}}$$

13)
$$\frac{4v^{-3} \cdot 3uv}{4u^{-3} v^{-3}}$$

14)
$$\frac{4y}{4y \cdot 2yx^2}$$

Answers to

1) $\frac{x^3 + 8x}{32}$

5) $\frac{2r - 5}{6r^2}; \{0\}$

9) $\frac{b^2}{4a}$

13) $3u^4v$

2) $\frac{2}{x^2}$

6) $4b; \{-5\}$

10) $\frac{2}{3x^5y^4}$

14) $\frac{1}{2yx^2}$

3) $\frac{x^4 - 625}{625x}$

7) $\frac{1}{3}; \{-9\}$

11) $2m^2n^4$

4) $\frac{633u}{200}$

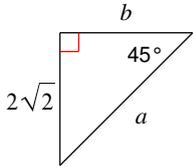
8) $\frac{1}{9x}; \{0, -2\}$

12) $2y^5x^3$

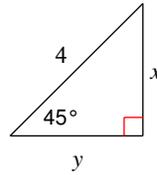
Special Right Triangles

Find the missing side lengths. Leave your answers as radicals in simplest form.

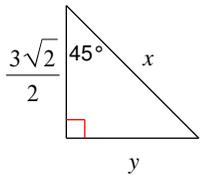
1)



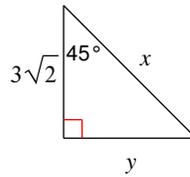
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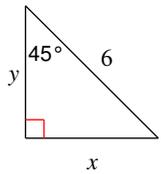
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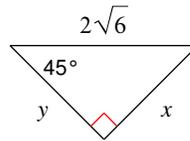
4)



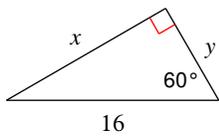
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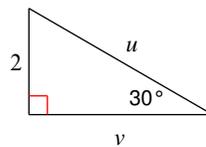
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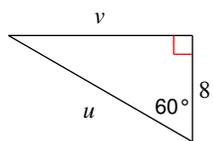
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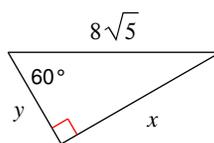
8)



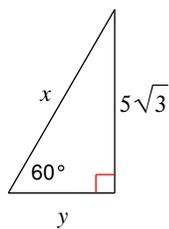
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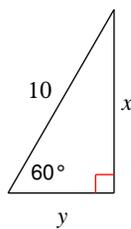
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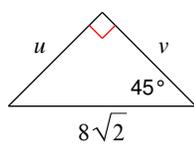
11)



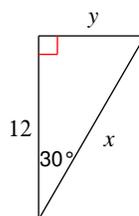
12)



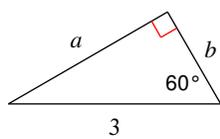
13)



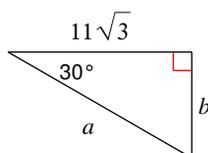
14)



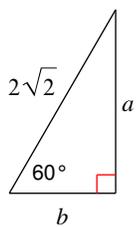
15)



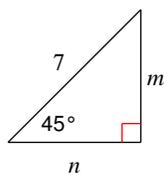
16)



17)



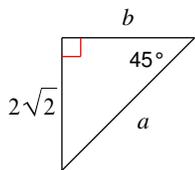
18)



Special Right Triangles

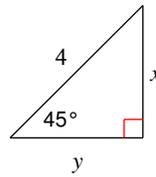
Find the missing side lengths. Leave your answers as radicals in simplest form.

1)



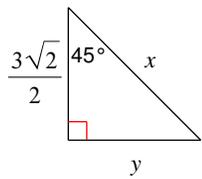
$$a = 4, b = 2\sqrt{2}$$

2)



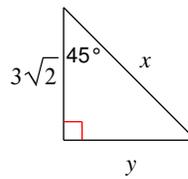
$$x = 2\sqrt{2}, y = 2\sqrt{2}$$

3)



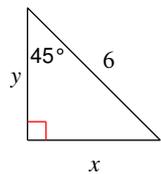
$$x = 3, y = \frac{3\sqrt{2}}{2}$$

4)



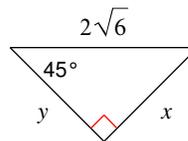
$$x = 6, y = 3\sqrt{2}$$

5)



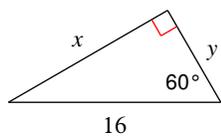
$$x = 3\sqrt{2}, y = 3\sqrt{2}$$

6)



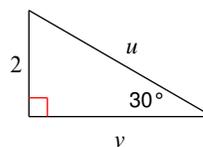
$$x = 2\sqrt{3}, y = 2\sqrt{3}$$

7)



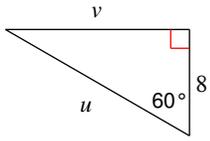
$$x = 8\sqrt{3}, y = 8$$

8)



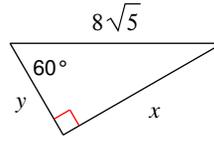
$$u = 4, v = 2\sqrt{3}$$

9)



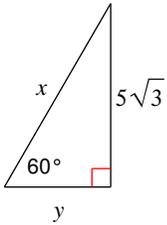
$$u = 16, v = 8\sqrt{3}$$

10)



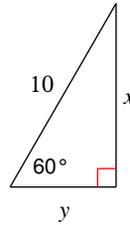
$$x = 4\sqrt{15}, y = 4\sqrt{5}$$

11)



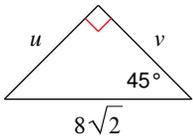
$$x = 10, y = 5$$

12)



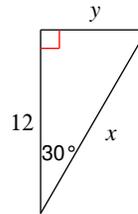
$$x = 5\sqrt{3}, y = 5$$

13)



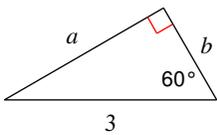
$$u = 8, v = 8$$

14)



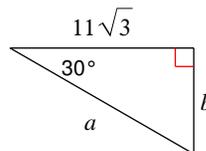
$$x = 8\sqrt{3}, y = 4\sqrt{3}$$

15)



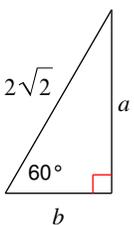
$$a = \frac{3\sqrt{3}}{2}, b = \frac{3}{2}$$

16)



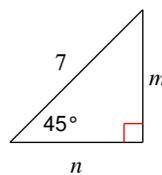
$$a = 22, b = 11$$

17)



$$a = \sqrt{6}, b = \sqrt{2}$$

18)



$$m = \frac{7\sqrt{2}}{2}, n = \frac{7\sqrt{2}}{2}$$

System of Equations

Name _____

Solve each system by graphing.

1) $2x - 3y = -9$
 $2x + 3y = -3$

2) $2x + y = 4$
 $x - y = -1$

3) $7x - 2y = 6$
 $x - 2y = -6$

4) $4x + y = 1$
 $x + y = -2$

5) $x - y = 2$
 $4x + y = 3$

6) $x - 4y = 12$
 $3x + 4y = 4$

7) $x + 4y = 4$
 $x - 2y = -8$

8) $3x + y = -2$
 $x + 2y = 6$

Answers to

1) $(-3, 1)$
5) $(1, -1)$

2) $(1, 2)$
6) $(4, -2)$

3) $(2, 4)$
7) $(-4, 2)$

4) $(1, -3)$
8) $(-2, 4)$

Isolate the Variable

Name _____

Solve each equation for the indicated variable.

1) $ka = v + w$, for a

2) $u = a - k + b$, for a

3) $a + k = w + v$, for a

4) $k + a = w - v$, for a

5) $ma = b + n + p$, for a

6) $g = ca(r + d)$, for a

7) $a + k = wv - b$, for a

8) $x + k = y + wv$, for x

Answers to

$$1) a = \frac{v+w}{k}$$

$$2) a = u + k - b$$

$$3) a = -k + w + v$$

$$4) a = -k + w - v$$

$$5) a = \frac{b+n+p}{m}$$

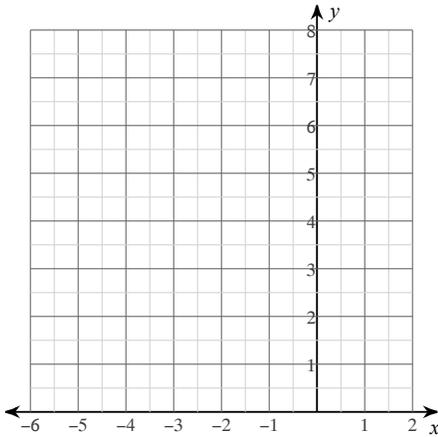
$$6) a = -\frac{g}{-cr - cd}$$

$$7) a = wv - k - b$$

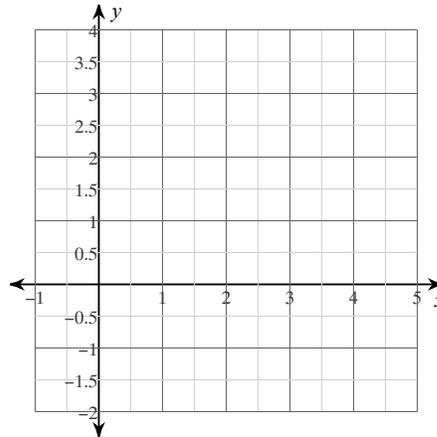
$$8) x = wv + y - k$$

Sketch the graph of each function.

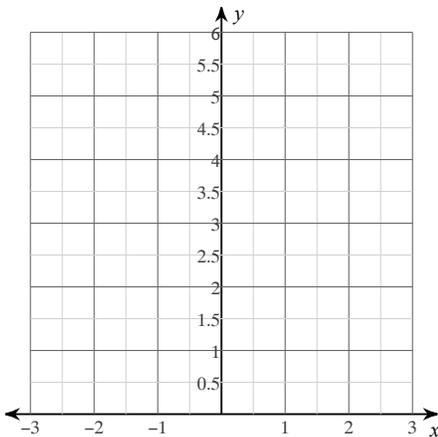
1) $y = (x + 2)^2 + 3$



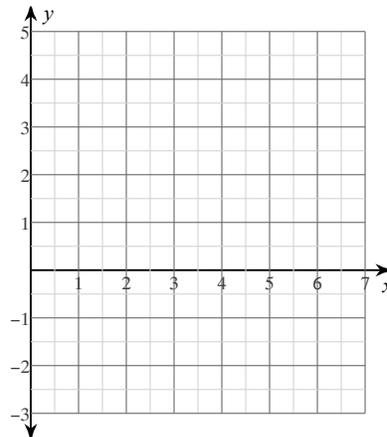
2) $y = (x - 2)^2 - 1$



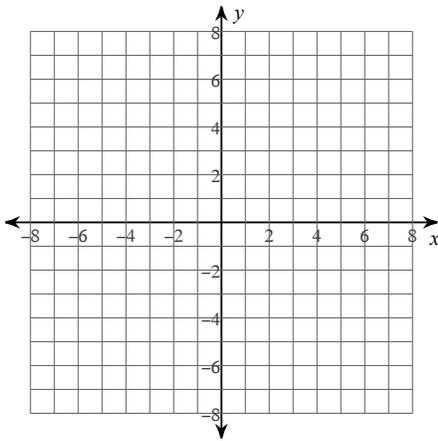
3) $y = (x - 1)^2 + 1$



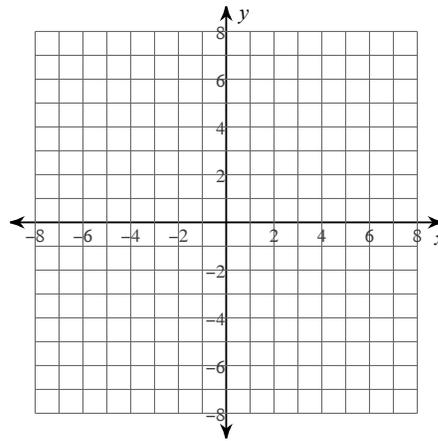
4) $y = (x - 4)^2 - 1$



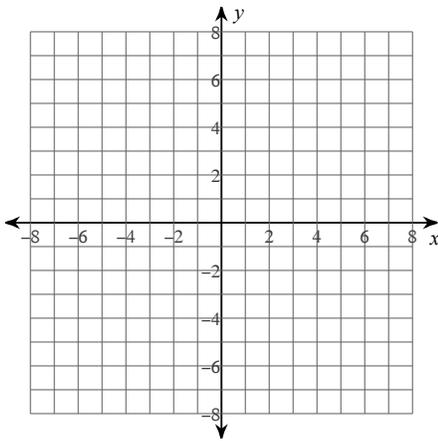
5) $y = \sqrt{x+4}$



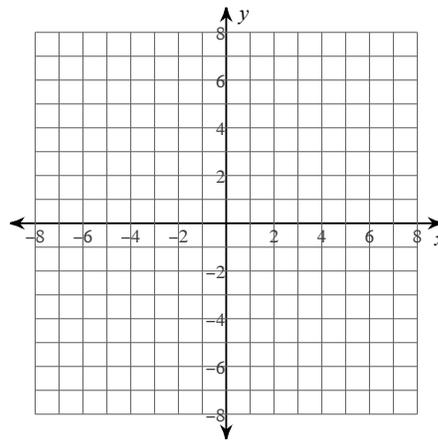
6) $y = \sqrt{x+6}$



7) $y = 5 + \sqrt{x}$

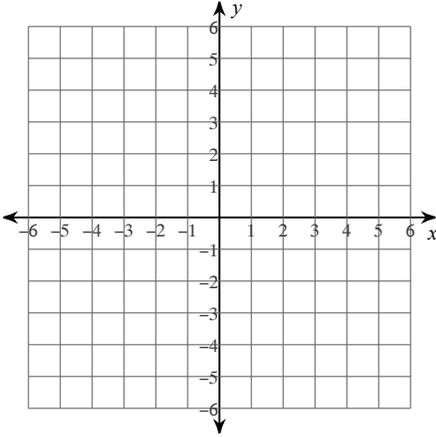


8) $y = \frac{1}{2}\sqrt{x} - 5$

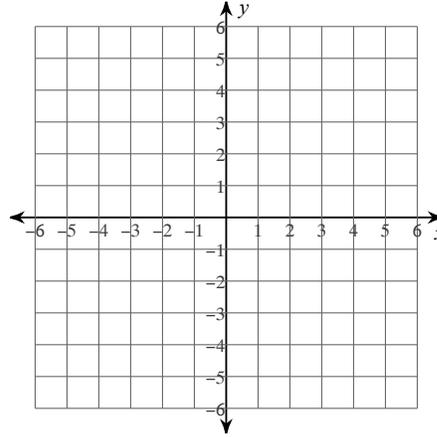


Sketch the graph of each line.

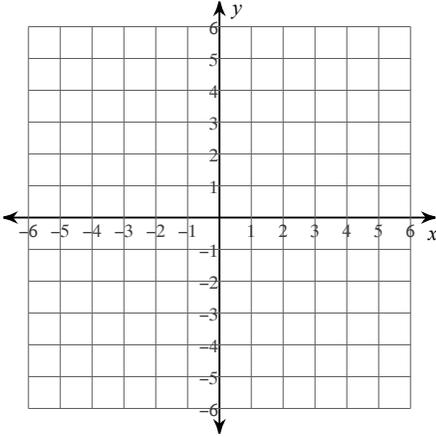
9) $4y = -20 + 14x$



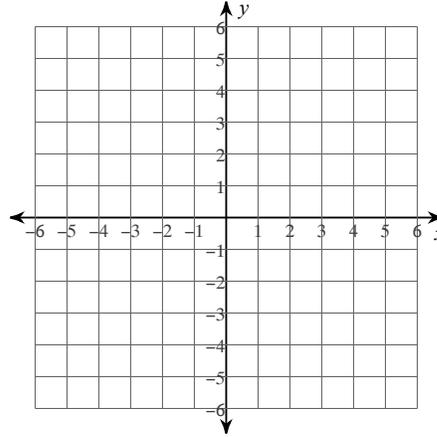
10) $2y - 7x = 10$



11) $-4y + x = 8$

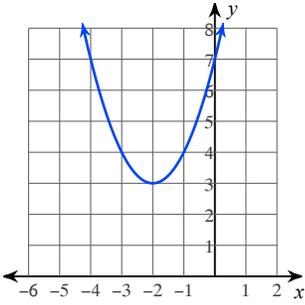


12) $6x + 5y - 25 = 0$

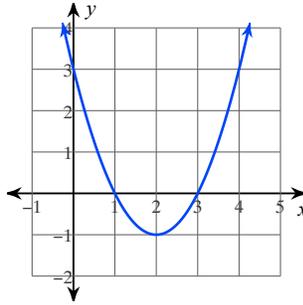


Answers to

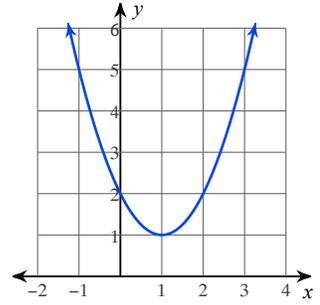
1)



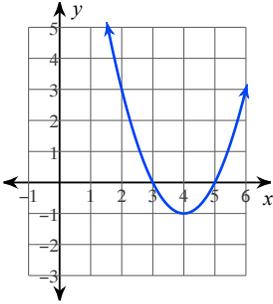
2)



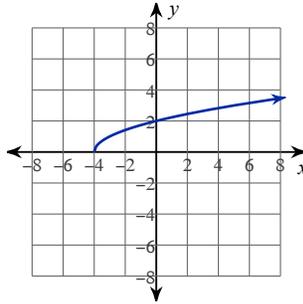
3)



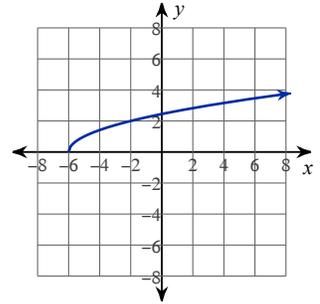
4)



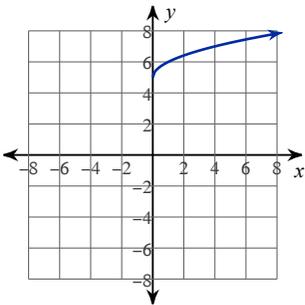
5)



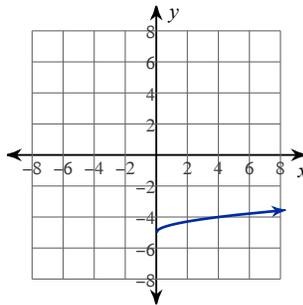
6)



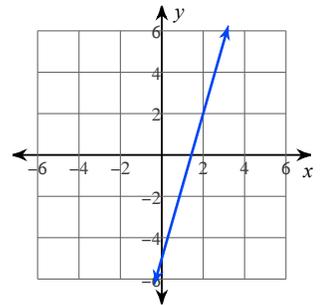
7)



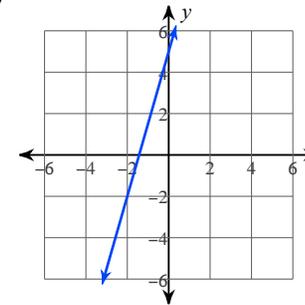
8)



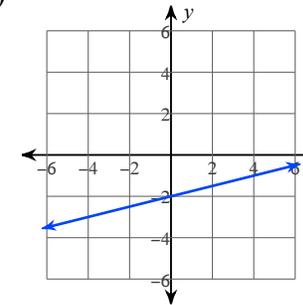
9)



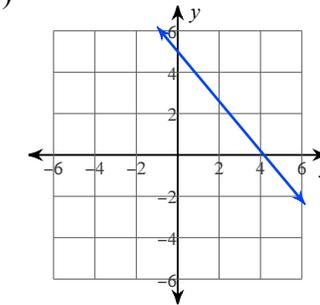
10)



11)



12)



Solve by Factoring

Name _____

Solve each equation by factoring.

1) $p^2 - 24 = 2p$

2) $a^2 = 64$

3) $b^2 = 36$

4) $v^2 - 2v = 15$

5) $b^2 + b - 2 = 0$

6) $k^2 - 15k + 56 = 0$

7) $8x^2 - 24x - 224 = 0$

8) $x^2 + 6x + 8 = 0$

9) $n^2 - 7n = 0$

10) $8x^2 - 56x - 64 = 0$

Answers to

1) $\{6, -4\}$
5) $\{1, -2\}$
9) $\{7, 0\}$

2) $\{8, -8\}$
6) $\{8, 7\}$
10) $\{-1, 8\}$

3) $\{6, -6\}$
7) $\{-4, 7\}$

4) $\{-3, 5\}$
8) $\{-2, -4\}$