

1) Students will be able to simplify expressions using Exponent Rules:

$$a^m \times a^n = a^{m+n} \quad (a^m)^n = a^{mn} \quad \frac{1}{a^n} = a^{-n} \quad \sqrt{a} = a^{1/2}$$

$$\frac{a^m}{a^n} = a^{m-n} \quad (ab)^m = a^m b^n \quad \frac{1}{a^{-n}} = a^n$$

$$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m} \quad a^0 = 1$$

Simplify with positive exponent answers.

$$\begin{array}{llll} \text{a) } \frac{(2a)^3}{32a^{-2}} & \text{b) } \left(\frac{24a^4b^{-3}}{8a^2}\right)^2 & \text{c) } \frac{(3ab^{-3})^3}{(3a^5)^{-1}} & \text{d) } \left(\frac{4a^3}{18a^{-1}}\right)^{-2} \\ \text{e) } \frac{a^3b^{-5}}{a^{-2}b^2} & \text{f) } \frac{(a^2b)^3}{a^{-2}b^7} & \text{g) } \frac{(a^{-2}b^3)^{-2}}{(a^5b^7)^0} & \text{h) } \frac{a^0b^9}{(a^2b^{-3})^{-2}} \end{array}$$

2) Order of Operations: PEMDAS

Evaluate using PEMDAS.

$$\text{a) } 8 - [19 - (2 + 5) - 7] \quad \text{b) } 2 + 7 \times 11 - 12 \div 3 \quad \text{c) } (3 + 7) \div (7 - 12)$$

Evaluate the following expressions involving variables.

$$\begin{array}{ll} \text{d) } \frac{4x}{9x^2 - 3x + 1} \text{ when } x = 2. & \text{e) } \frac{z^2}{z-x} + \frac{x^2}{x-y} \text{ when } x = 1, y = -2, \text{ and } z = 4. \\ \text{f) } \frac{4xy}{y^2 - x^2} \text{ when } x = 3 \text{ and } y = 2. & \text{g) } \frac{x^2 - z^2}{xz - 2x(z-x)} \text{ when } x = -1 \text{ and } z = 3. \end{array}$$

3) Solve Multi-Step Equations

$$\begin{array}{lll} \text{a) } 5n - 16 - 8n = -10 & \text{b) } -34 = v + 42 - 5v & \text{c) } x - 1 + 5x = 23 \\ \text{d) } 42j + 18 - 19j = -28 & \text{e) } -49 = 6c - 13 - 4c & \text{f) } -28 + 15 - 22z = 31 \\ \text{g) } -q - 11 = 2q + 4 & \text{h) } 4t + 9 = -8t - 13 & \text{i) } 22p + 11 = 4p - 7 \end{array}$$

4) Students will be able to graph points and find the slope given two points.

Points can be identified by ordered pairs, written (x, y) . The x -coordinate is positive in Quadrants I and IV; the y -coordinate is positive in Quadrants I and II. The slope of a line can be calculated as $m = \frac{y_2 - y_1}{x_2 - x_1}$

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

- a) $(4, 5), (6, 2)$ b) $(3, 8), (7, 3)$ c) $(8, -4), (-6, -3)$ d) $(-2, -3), (6, 5)$

5) Write an equation of a line in slope-intercept form: $y = mx + b$

Write an equation of a line with the given slope m and y -intercept b .

- a) $m = -1, b = 3$ b) $m = 4, b = -2$ c) $m = -5, b = -8$

6) Write an equation of a line using point-slope form: $y - y_1 = m(x - x_1)$

Write an equation of the line in slope-intercept form through the given point and with the given slope m .

- a) $(2, 1); m = 3$ b) $(-3, -5); m = -2$ c) $(-4, 11); m = \frac{3}{4}$ d) $(0, -3); m = -\frac{2}{3}$

Write an equation in point-slope form of the line that passes through the given points.

- e) $(2, 6)$ and $(-4, -2)$ f) $(-1, 3)$ and $(-3, 1)$ g) $(2, 8)$ and $(-3, 6)$

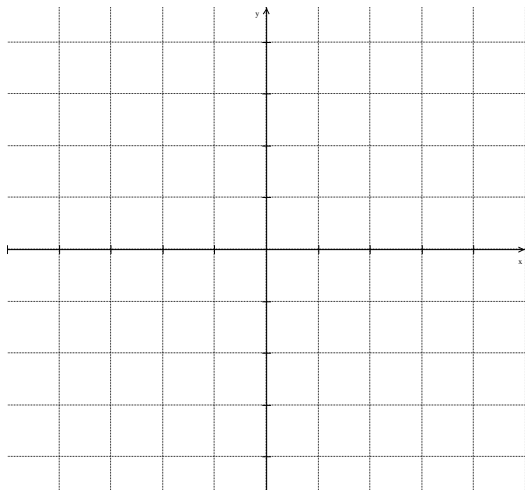
7) Students will be able to graph points and lines on a coordinate plane

Points can be identified by ordered pairs, written (x, y) .

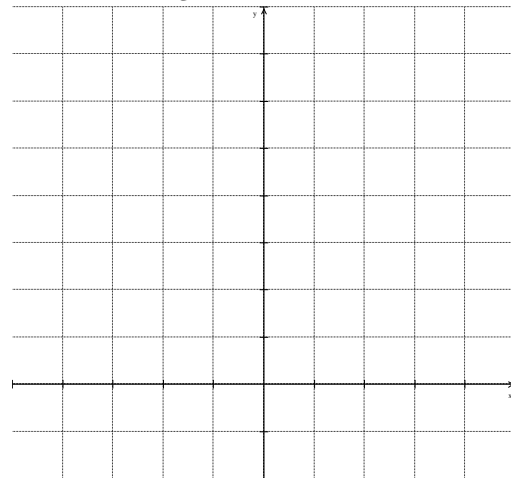
A line in slope-intercept form ($y = mx + b$) can be graphed by graphing the y -intercept first, and then following the slope to another point. Lines with positive slopes rise to the right; lines with negative slopes fall to the right.

Horizontal lines have the form $y = b$ while vertical lines have the form $x = a$, where a is a constant.

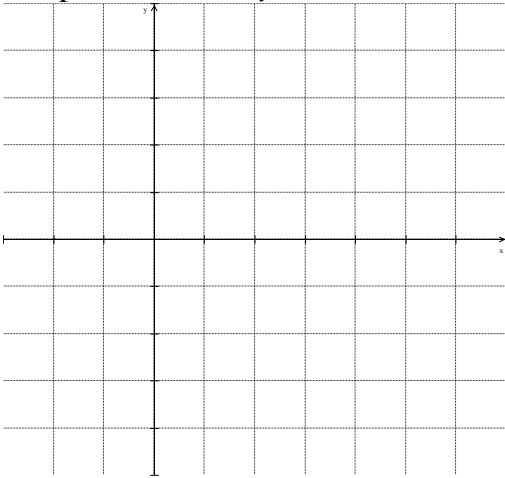
- a) Graph the points:
 $A(2, -3); B(0, 3); C(-1, -4)$



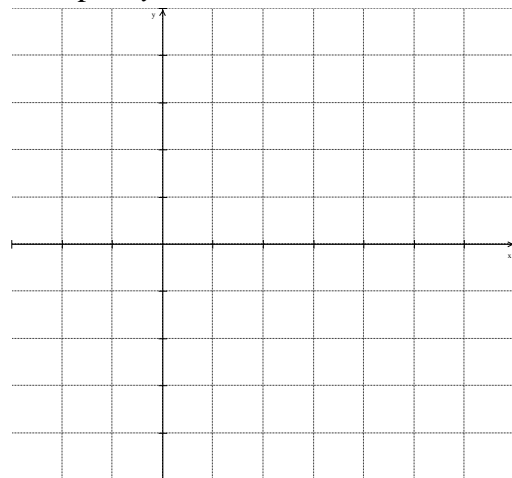
- b) Graph: $y = \frac{-2}{3}x + 5$



c) Graph: $x=4$ and $y=-2$



d) Graph: $y=2x-1$



8) Students will be able to solve quadratic equations

All quadratic equations have two solutions.

To **solve by factoring**, write the equation in standard form ($x^2 + bx + c = 0$), factor it and use the zero product property to solve (if $ab = 0$, then $a = 0$ or $b = 0$).

To solve using the **principle of square roots**, isolate the quadratic term and then take the square root of both sides.

Solve.

a) $x^2 - 9 = 0$

b) $4x^2 = 25$

c) $x^2 + 2x - 8 = 0$

d) $x^2 + 2x = 15$

e) $x^2 = 3x + 28$

f) $x^2 + 4x + 3 = 0$

ANSWERS:

- 1a) $\frac{a^5}{4}$
- b) $\frac{9a^4}{b^6}$
- c) $\frac{81a^8}{b^9}$
- d) $\frac{81}{4a^8}$
- e) $\frac{a^5}{b^7}$
- f) $\frac{a^8}{b^4}$
- g) $\frac{a^4}{b^6}$
- h) a^4b^3

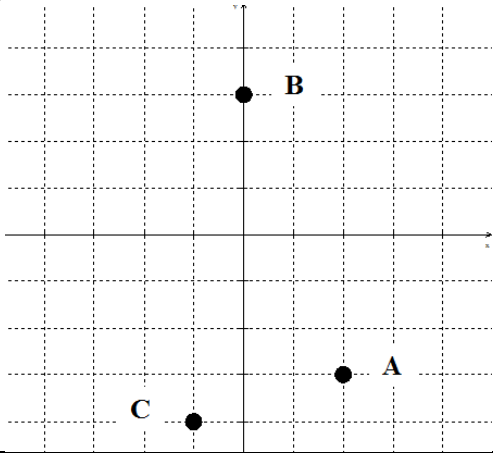
- 2a) 3
- b) 75
- c) -2
- d) $\frac{8}{31}$
- e) $\frac{17}{3}$
- f) $\frac{24}{-5}$
- g) $\frac{-8}{5}$
- 3a) -2
- b) 19
- c) 4
- d) -2
- e) -18
- f) -2
- g) -5

- 3h) $-\frac{11}{6}$
- i) -1
- 4a) $\frac{3}{-2}$
- b) $\frac{5}{-4}$
- c) $-\frac{1}{14}$
- d) 1
- 5a) $y = -x + 3$
- b) $y = 4x - 2$
- c) $y = -5x - 8$

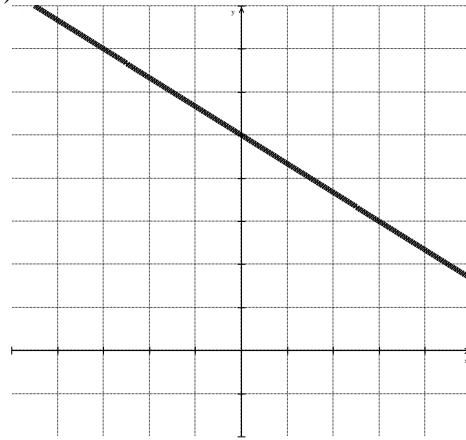
- 6a) $y - 1 = 3(x - 2)$
 $y = 3x - 5$
- b) $y + 5 = -2(x + 3)$
 $y = -2x - 11$
- c) $y - 11 = \frac{3}{4}(x + 4)$
 $y = \frac{3}{4}x + 14$
- d) $y + 3 = \frac{-2}{3}(x - 0)$
 $y = \frac{-2}{3}x - 3$

- 6e) $m = \frac{4}{3}$
 $y - 6 = \frac{4}{3}(x - 2)$
- f) $m = 1$
 $y - 3 = (x + 1)$
- g) $m = \frac{2}{5}$
 $y - 8 = \frac{2}{5}(x - 2)$

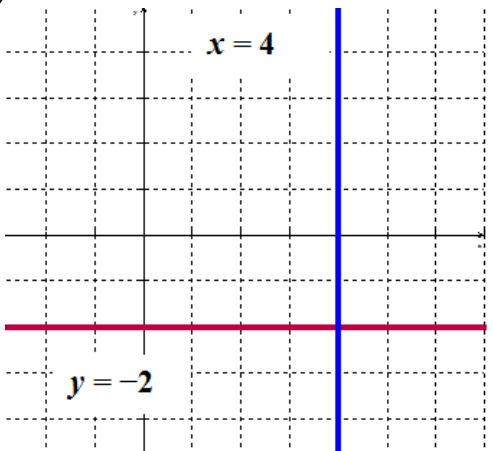
7a)



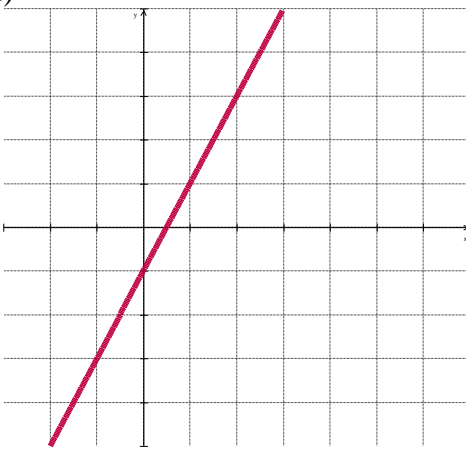
7b)



7c)



7d)



8a) $x = \pm 3$

b) $x = \pm \frac{5}{2}$

c) $x = 2, -4$

d) $x = 3, -5$

e) $x = 7, -4$

f) $x = -1, -3$