

Algebra One Topics Expected to Know

- 1. Equation Solving**
- 2. Systems of equations**
- 3. Exponents**
- 4. Writing equations of functions**
- 5. Graphing functions**

1. Equation Solving

A. $6x - 7 = 8x + 31$

$$\begin{array}{rcl} -38 & = & 2x \\ \boxed{-19} & = & x \end{array}$$

B. $3(3x - 7) - 8x = 5 - 2(x + 1)$

$$\begin{aligned} 9x - 21 - 8x &= 5 - 2x - 2 \\ x - 21 &= 3 - 2x \\ 3x &= 24 \\ \boxed{x = 8} \end{aligned}$$

C. $(3x + 2)^2 = 25$

$$\begin{aligned} \sqrt{(3x+2)^2} &= \sqrt{25} \\ 3x + 2 &= \pm 5 \end{aligned}$$

$3x + 2 = 5 \text{ AND } 3x + 2 = -5$

$$\begin{aligned} 3x &= 3 & 3x &= -7 \\ \boxed{x = 1} & \text{ AND } & \boxed{x = \frac{-7}{3}} \end{aligned}$$

2. Systems of equations

A. $\begin{aligned} 5x + 8y &= 11 \\ 2x - 3y &= -8 \end{aligned}$

$$\begin{aligned} x &= -1 \\ y &= 2 \end{aligned}$$

B. $\begin{aligned} x &= 5y - 2 \\ 2x + 5y &= -19 \end{aligned}$

$$\begin{aligned} x &= -7 \\ y &= -1 \end{aligned}$$

3. Exponents (simplify)

A. $x^6 + x^6$

$$2x^6$$

B. $x^6 - x^6$

$$0$$

C. $x^6 (x^6)$

$$x^{12}$$

D. $\frac{x^6}{x^6}$

$$x^0 = 1$$

E. $(x^6)^6$

$$x^{36}$$

$$\begin{array}{r} 81 \\ \times 25 \\ \hline 405 \\ 162 \\ \hline 2025 \end{array}$$

F. $(3x - 2)(2x + 4)$

$$\begin{array}{r} (6x^2 + 12x - 4x - 8) \\ (6x^2 + 8x - 8) \\ \hline 2(3x^2 + 4x - 4) \end{array}$$

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

$$\begin{array}{r} (3x-2)(3x-2) \\ 9x^2 - 12x + 4 \\ \hline 2025x^4 \end{array}$$

H. $(5x)^2(3x^3)^4$

$$\begin{array}{r} 25x^2 \cdot 81x^{12} \\ 2025x^{14} \end{array}$$

I. $2x(4x + 3)^2$

$$\begin{array}{r} 2x(4x+3)(4x+3) \\ 2x(16x^2 + 24x + 9) \\ 32x^3 + 48x^2 + 18x \end{array}$$

4. Writing equations of functions

A. Write the equation of a line that contains (-3, 4) with a slope of 2

$$y - 4 = 2(x + 3) \quad y = 2x + 10$$

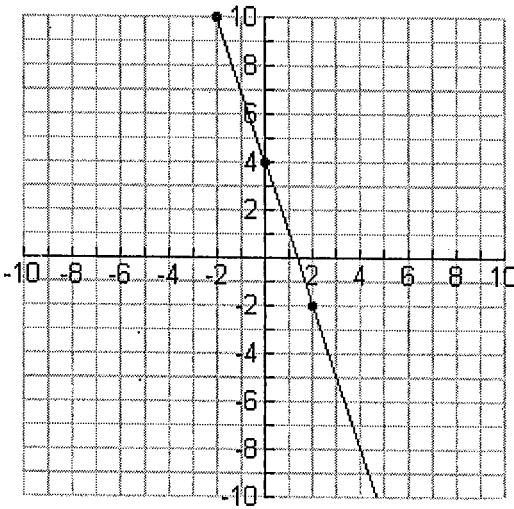
B. Write the equation of a line that contains (4, -7) and (-2, 4)

$$m = \frac{4 - (-7)}{-2 - 4} = \frac{11}{-6}$$

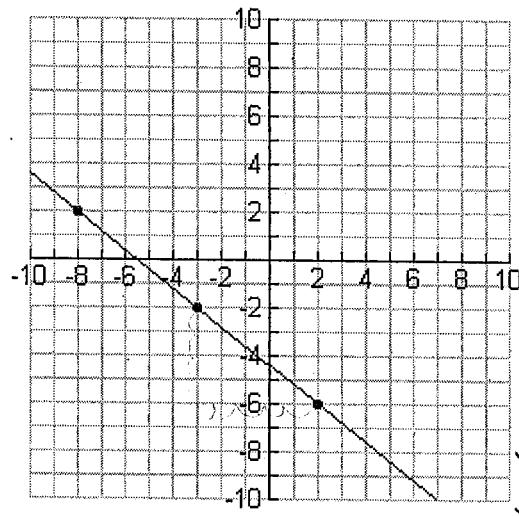
either $y + 7 = \frac{11}{-6}(x - 4)$
or $y - 4 = \frac{11}{-6}(x + 2)$

C. Write the equation of these lines

$$y = -\frac{11}{6}x + \frac{1}{3}$$



$$y = -3x + 4$$

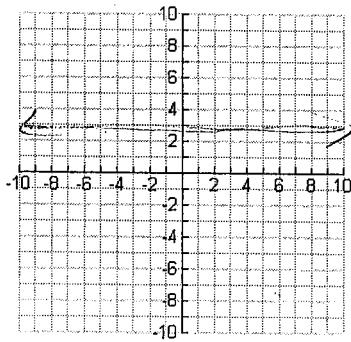


$$y + 6 = -\frac{4}{5}(x - 2)$$

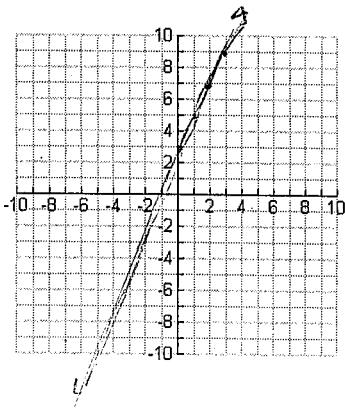
$$\begin{aligned} y &= -\frac{4}{5}x + \frac{18}{5} - \frac{30}{5} \\ y &= -\frac{4}{5}x - \frac{12}{5} \end{aligned}$$

5. Graphing functions

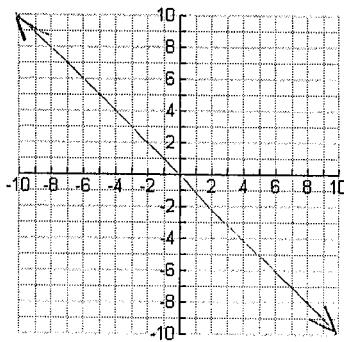
A. $y = 3$



B. $y = 2x + 3$



C. $y = -x$



D. Give the x and y intercepts for the function in B

$$x \text{ int: } (-\frac{3}{2}, 0) \rightarrow m + b? \rightarrow 0 = 2x + 3$$

$$y \text{ int: } (0, 3)$$

$$\begin{aligned} -3 &= 2y \\ -\frac{3}{2} &= x \end{aligned}$$