

Name: _____

Algebra I Prerequisite Packet

1. Simplify the following expressions. (Do not use a calculator)

a. $8a^2(5a^3 - 2a - 7) =$ _____ b. $\left(\frac{2}{3}p\right)\left(\frac{6}{7}q\right) =$ _____ c. $\frac{12m^2n}{9mn^4} =$ _____

d. $(a-5)(4a-9)$ e. $(2x+5y)^2$ f. $(2x^2 - 3x + 5) - (7x^2 + 8x + 11)$ g. $7(5-2x) - (1-x)$

d. _____ e. _____ f. _____ g. _____

2. Find the value of each expression. (Do not use a calculator)

a. $(-5)^2$ _____ b. -7^2 _____ c. $2 - 3 \cdot 2^2$ _____ d. $-2(5+3)^2$ _____

e. 4^{-2} _____ f. $5 \cdot 3^0 + 10^0$ _____ g. $12 - (5 - 8) - [-4 - (-18)]$ _____

3. Simplify each radical expression (no decimal approximations and no calculators)

a. $8\sqrt{12}$ _____ b. $(3\sqrt{2})^2$ _____ c. $4\sqrt{5} \cdot 2\sqrt{10}$ _____

d. $\frac{12\sqrt{20}}{\sqrt{5}}$ _____ e. $5\sqrt{2} + \sqrt{3} + 8\sqrt{2}$ _____ f. $\sqrt{98} + \sqrt{18}$ _____

4. Factor each of the following expressions:

a. $3x^2 + 6x =$ _____ b. $9x^2 - 25 =$ _____ c. $x^2 + 7x + 6$ _____

d. $2x^2 - 18 =$ _____ e. $x^3 - 3x^2 - 10x =$ _____

5. The ratio of three angles of a triangle is 3:4:5. Define variables and write an equation to be used to find the measure of the largest angle. Solve it and state the measure of the largest angle.

Equation: _____

Largest \angle _____

6. Solve the following equations. Show work.

a. $2x(x-5) = 16 - x(13-2x)$

b. $a - 6 = -6 - (3a - 7) - 2a$

c. $\frac{2}{3}(y-9) = \frac{3}{4}(y+8)$

d. $\frac{x}{180-x} = \frac{7}{5}$

e. $x^2 - x = 6$

f. $3x^2 - 5x = 0$

g. $x^2 = 4x + 21$

h. $x^2 + 5x + 3 = 0$ (show & use quadratic formula)

i. $\frac{x}{x+3} = \frac{x-4}{3}$

7. Write an equation of each line described below. Write answers c & d in $y = mx + b$ form and answers e & f in point slope form : $y - y_1 = m(x - x_1)$. Show appropriate work.

a. vertical line thru $(5,2)$ _____ b. horizontal line thru $(-2,6)$ _____

c. line thru $(15, -1)$ with slope $\frac{2}{3}$ d. line thru $(2,3)$ and $(-2, 5)$

e. line thru $(-3,9)$ and parallel to $y = \frac{2}{3}x + 1$ f. line thru $(6, 2) \perp$ to $5x + 2y = 12$

8. a. Find the x-intercept and y-intercept of the line with equation $5x - 2y = 7$

x-intercept (_____, _____) y-intercept (_____, _____)

b. Let $A = (5, -1)$ and $B = (-9, -5)$ and write and use appropriate formulas to find:
(i) the midpoint between A and B (ii) the distance from A to B

Answer _____

Answer _____

9. Solve each system of equations. Show key steps.

a.
$$\begin{cases} y = 2x - 1 \\ 4x + 6y = -14 \end{cases}$$

b.
$$\begin{cases} 20x - 8y = -4 \\ 3x + 4y = 7.2 \end{cases}$$

10. Determine k so that point P is on the given line. $P = (k, 2k)$; Line: $3x + 4y = -22$

11. Use the coordinate planes provided below to graph each equation or system of equations and inequalities. Identify the solution to the equation and indicate the solution to the inequality by shading clearly.

a.
$$\begin{cases} y = 2 \\ 3x - 4y = -20 \end{cases}$$

Sol. _____

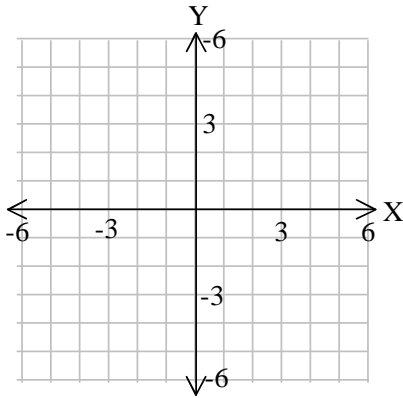
b.
$$\begin{cases} 2x + y = 5 \\ x - 3y = 6 \end{cases}$$

Sol. _____

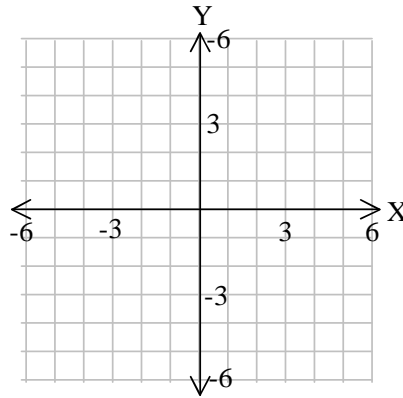
c.
$$\begin{cases} x \geq -1 \\ y \leq 2 \end{cases}$$

Sol. _____

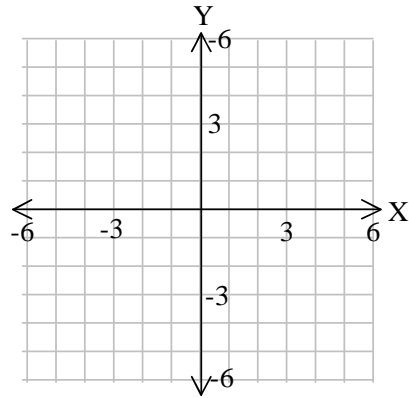
a.



b.



c.



12. The width of a sheet of cardboard is three inches more than twice the length. If the area is 77 inches squared, what are the length and width of the cardboard rectangle?

13. Callie is five years more than three times as old as her sister Tanya. The sum of their ages is 25.
How old is Callie?