

Provide all work and solution on separate sheets of loose leaf. Be sure to show your solutions to demonstrate concept mastery.

### ***Solving Linear Equations***

Solve each equation.

1.  $6x + 5 = 17$

2.  $5x - 4 = 7x + 12$

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

4.  $\frac{2}{3}x + \frac{1}{4} = 2x - \frac{5}{6}$

5.  $\frac{1}{4}z + \frac{2}{3} = \frac{1}{2}z - \frac{3}{4}$

Solve the equation for  $y$ .

6.  $3x + 5y = 9$

7.  $4x - 3y = 14$

### ***Solving Linear Inequalities***

Solve the inequality. Then, graph your solution set.

8.  $4x + 5 > 25$

9.  $7 - n \leq 19$

10.  $5 + \frac{1}{3}n \geq 6$

11.  $4x - 1 > 14 - x$

12.  $5 - 5x > 4(3 - x)$

### ***Simplifying Expressions***

Simplify the expression by collecting like terms.

13.  $-2x + 4y - 10 + x$

14.  $4y + 6x - 3(x - 2y)$

15.  $5(x^2 - 9x) - 2(3x + 4) + 7$

16.  $2(x^2 + x) - 3(x^2 - 4x) + 12x$

Evaluate the expression. Remember the Order of Operations.

17.  $-3 - 6 \div 2 - 12$

18.  $-5 \div 1 + 2(7 - 10)^2$

19.  $7x - 3x - 8x^3$  when  $x = -1$

20.  $3ab^2 + 5a^2b - 1$  when  $a = 2$  and  $b = -2$

**Slope**

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Find the slope of the line passing through the given points.

21.  $(-3, 5)$  and  $(2, 1)$

22.  $(1, -4)$  and  $(2, 6)$

23.  $(-6, 6)$  and  $(6, -6)$

24.  $(-9, 8)$  and  $(-9, 2)$

25.  $(-7, 3)$  and  $(-2, 3)$

26.  $(4, 2)$  and  $(18, 4)$

**Linear Equations**

$$y = mx + b$$

$$y - y_1 = m(x - x_1)$$

Write an equation for the line described.

27. passing through  $(3, 4)$  with slope  $-3$

28. passing through  $(-6, 4)$  with slope  $\frac{1}{2}$

29. passing through  $(5, -1)$  and parallel to  $y = 5x + 2$ .

30. passing through  $(6, -4)$  and perpendicular to  $y = 2x - 1$ .

**Polynomials**

Perform the indicated operation.

31.  $(50x - 3) + (8x^3 + 7x^2 + x + 4)$

32.  $(3x^3 + 10x + 5) - (x^3 - 4x + 6)$

33.  $(7x^2 + 10x - 3) + (x^3 - 2x + 17)$

34.  $(10x^3 - 4x^2 + 3x) - (x^3 - x^2 + 1)$

35.  $2x(4x^2 - 5x - 2)$

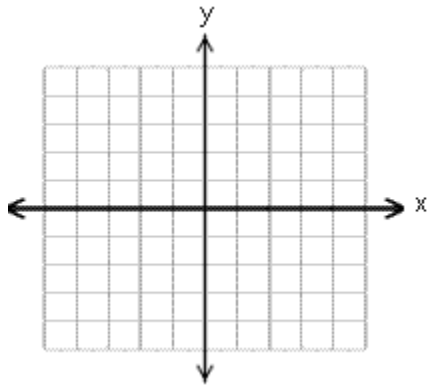
36.  $(2x + 1)(3x - 5)$

37.  $(x - 3)(2x^2 + 3x - 7)$

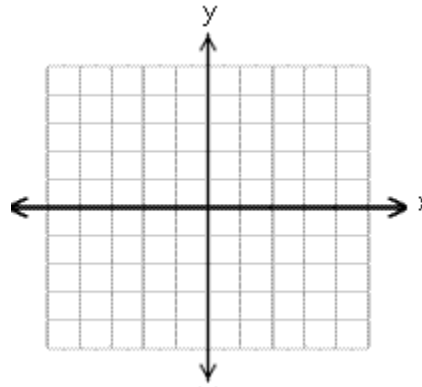
38.  $\frac{5x^3 - 10x^2 + 15x}{5x}$

**Linear Systems** Solve by GraphingSolve the linear systems by graphing.

39. 
$$\begin{cases} y = 2x - 3 \\ y = -\frac{1}{2}x + 2 \end{cases}$$



40. 
$$\begin{cases} -2x + y = 5 \\ y = -x + 2 \end{cases}$$



**Laws of Exponents**

$$a^m \cdot a^n = a^{m+n}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$(a^m)^n = a^{m \cdot n}$$

41.  $x^5 \cdot x^4 =$

42.  $-2x^6 \cdot 3x^2 =$

43.  $-3y^3 \cdot -4y^8 =$

44.  $\frac{a^8}{a^4} =$

45.  $\frac{15a^{11}}{-3a^6} =$

46.  $\frac{18x^3}{24x^{12}} =$

47.  $(y^5)^4 =$

48.  $(2x^4)^3 =$

49.  $(-3y^2)^3 =$

**Scientific Notation**

Express each in scientific notation.

50. 5,284,000

51. 0.00678

52.  $(2 \times 10^8) \times (4 \times 10^5)$

53.  $\frac{55 \times 10^{20}}{11 \times 10^{10}}$

54.  $(2.5 \times 10^6) \times (5 \times 10^4)$

55.  $\frac{3 \times 10^9}{4 \times 10^3}$