

**Directions:** Be sure to SHOW ALL WORK in the space provided for each problem.

### Table of Contents

I. Finding Slope

II. Graphing Linear Equations

III. Solving for a Variable

IV. Finding Area and Perimeter

V. Systems of Equations

VI. Polynomials

VII. Factoring

VIII. Exponents

IX. Radicals

**I. Finding Slope**

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

1.  $(5, 1)$  and  $(2, 7)$

2.  $(-4, 3)$  and  $(2, -3)$

3.  $\left(-\frac{1}{2}, -2\right)$  and  $\left(-\frac{3}{2}, 1\right)$

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

Find the slope of each line.

5.  $y = -2x + 5$

6.  $3x + 6y = 12$

7. Give the slopes of the lines parallel and perpendicular to  $y = 32x - 1$ .

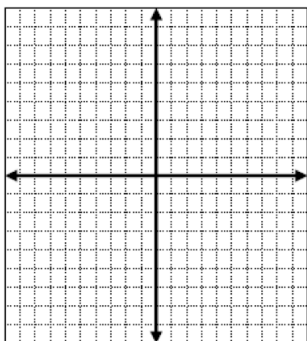
Parallel \_\_\_\_\_

Perpendicular \_\_\_\_\_

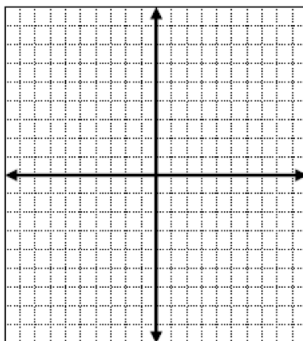
**II. Graphing Linear Equations**

Graph the following equations on the coordinate plane.

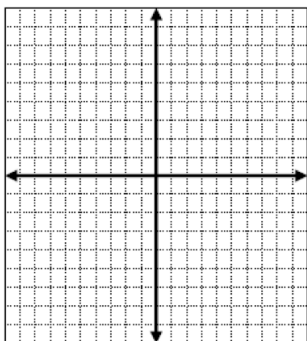
8.  $y = 3x - 2$



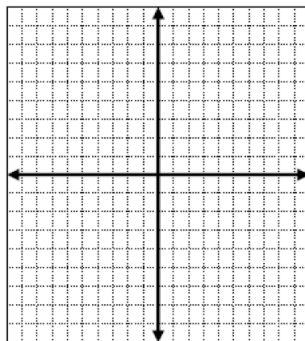
9.  $3x - 2y = 12$



10.  $x = -4$



11.  $y - 2 = 3(x + 4)$



**III. Solving for a variable**

Solve each equation for x.

12.  $5x + 3 = -12$

13.  $(6x - 8) - (5x + 9) = 3$

14.  $7x - 8x + 4 = 5x - 2$

15.  $3(x - 2) = 18$

Solve each proportion for x.

16.  $\frac{18}{x} = \frac{6}{5}$

17.  $\frac{x+2}{3} = \frac{8}{15}$

18.  $\frac{5}{7} = \frac{10}{x-2}$

19.  $\frac{12}{x} = 48$

20. The ratio of faculty members to students at a college is 1:15. There are 675. How many faculty members are there?

21. A runner ran at a rate of 6 miles per hour. What is this speed in miles per minute?

**IV. Finding Area and Perimeter**

Find the area and perimeter of each figure described below.

26. A rectangle with length 11ft and width 4ft.

27. A square with sides of length 21m.

28. A circle with radius 4in.

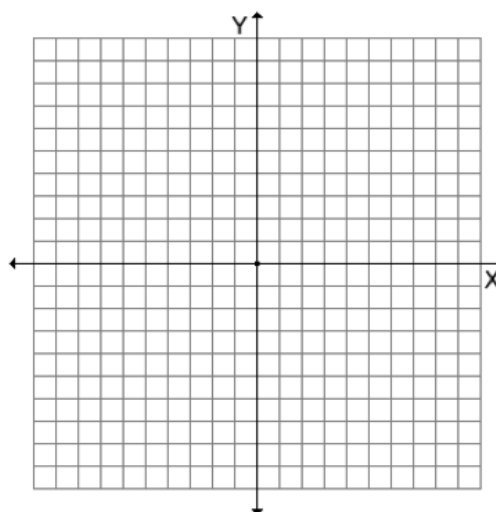
29. A triangle with height 5cm and base length 12cm.

30. A right triangle with a leg 3mi and hypotenuse 5mi.

### V. Systems of Equations

Solve the system of equation by graphing.

31.  $y = x - 3$   
 $y = -x + 1$



Solve the system of equations by substitution.

32.  $x + 4y = 6$   
 $x + y = 3$

33.  $3x - 2y = 12$   
 $y = 5 - 4x$

Solve the system of equations by elimination (or combination)

34.  $-x + 2y = 11$   
 $5x - 2y = 1$

35.  $2x + y = 3$   
 $-x + 3y = -12$

**VI. Polynomials**

Add or subtract the polynomials.

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

37.  $(a^4 - 2a) - (3a^4 - 3a - 1)$

Multiply polynomials.

38.  $(3x + 2)(2x + 7)$

39.  $(5n + 1)^2$

40.  $(2x + 7)(4x^2 - 3x + 2)$

41.  $(2x + 3)(3x^2 + 2x - 5)$

**VII. Factoring**

Factor

42.  $4x^2 - 3x$

43.  $x^2 + 6x + 8$

44.  $x^2 - 10x + 16$

45.  $x^2 + 7x - 18$

46.  $x^2 + 12x + 36$

47.  $25x^2 - 81$

48.  $5x^2 - 14x + 8$

49.  $4x^2 + 19x - 5$

Solve by factoring.

50.  $x^2 - 5x - 6 = 0$

51.  $v^2 - 4v = 0$

52.  $x^2 + 9 = 10x$

53.  $5x^2 = 2x + 3$

**VIII. Exponents**

Simplify.

54.  $2^5 \cdot 2^6$

55.  $(2^5)^6$

56.  $a^4 \cdot b^2 \cdot a^5$

57.  $(4x^2y^6)(-2x^3y^4)^2$

58.  $\frac{3^5}{3^2}$

59.  $\frac{6a^5b^9}{2a^4b^4}$

60.  $\frac{5x^2}{2y^3} \cdot \frac{2y^5}{3y^2}$

61.  $\left(\frac{a^4}{b^2}\right)^3$

62.  $\frac{6xy^4}{4x^3}$

63.  $-4f^{-3}g^4h^0$

64. The function  $f(x) = 2(3)^x$  models an insect population after  $x$  days. What will the population be on the 5th day?

**IX. Radicals**

Rewrite each of the following radicals in simple radical form.

65.  $\sqrt{24}$

66.  $\sqrt{17}$

67.  $\sqrt{75}$

68.  $\sqrt{50}$

69.  $\sqrt{18} + \sqrt{32}$

70.  $\sqrt{50} + \sqrt{32} - \sqrt{27}$