

**Functions**  
**Summer Assignment 2008**

Name \_\_\_\_\_

**Show all work!!!!**

**I. Factor completely.**

1.  $x^2 - 5x - 24$

\_\_\_\_\_

2.  $9x^2 - 81$

\_\_\_\_\_

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

\_\_\_\_\_

4.  $4a^2 + 3a - 1$

\_\_\_\_\_

5.  $4a^5 - 16a^3$

\_\_\_\_\_

6.  $3x^2 - 6x - 90$

\_\_\_\_\_

7.  $3x^2 + 8x + 5$

\_\_\_\_\_

8.  $r^3 - 11r^2 - 60r$

\_\_\_\_\_

9.  $7h^2 + 12h - 4$

\_\_\_\_\_

10.  $16x^4 - y^8$

\_\_\_\_\_

11.  $x^4 - 2x^3 + 3x - 6$

\_\_\_\_\_

12.  $(x - y)^2 - z^2$

\_\_\_\_\_

13.  $x^8 - 1$

\_\_\_\_\_

**II. Solve each system of equations.**

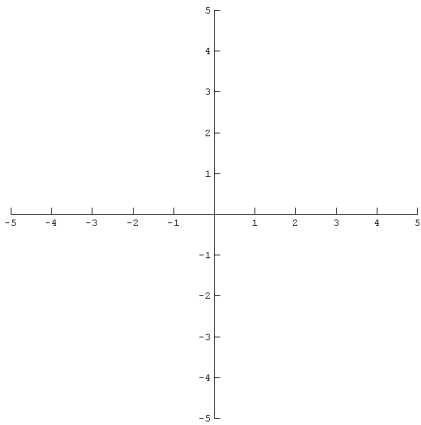
14.  $5x - 2y = -22$

$5x + 3y = -17$

15.  $y - 2x = 7$

$3x + 5y = 9$

16. Solve the system by graphing.  $\begin{cases} y = 2 - 3x \\ y = 2x - 3 \end{cases}$



16. \_\_\_\_\_

**III. Using Linear Systems as Models**

*Use two variables to set up each verbal model, then solve the system of equations to answer the word problem.*

17. Tickets to a concert are \$5 for balcony seats and \$10 for orchestra seats. If attendance was 600 and total receipts were \$4750, how many people bought orchestra seats?

\_\_\_\_\_

18. Your chemistry teacher asks you to mix 20% acid solution with 50% acid solution to obtain 12 ounces of 30% acid solution. How much of each must you use?

**IV. Solve each open sentence.**

19.  $7z - (2 + z) = 3(3z - 1)$

20.  $5(c + 3) + 4 < c - 1$

21.  $11 - 2(t - 1) \geq 9 - 2(t - 2)$

22.  $\frac{3}{x+5} + \frac{4}{x} = 2$

23.  $\frac{5}{x+2} - \frac{2x-1}{5} = 0$

24.  $\frac{y+2}{3} - \frac{y+1}{6} > 1$

\_\_\_\_\_

25.  $2(x-3)-4 < 2 \wedge 3x-(x+1) > 5$

\_\_\_\_\_

26.  $|y+2| = 5$

27.  $|3y-6| \leq 18$

\_\_\_\_\_

28.  $|2y+4| > 16$

29.  $2 \leq 4 - 3x < 7$

\_\_\_\_\_

30.  $2x^2 + 32x = 16x^2$

31.  $4x^2 + 7 = 16$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

32.  $\sqrt{3x-8} = 2$

\_\_\_\_\_

33.  $\sqrt{x-1} + 1 = 5$

\_\_\_\_\_

34.  $\sqrt{3y+4} = y-2$

\_\_\_\_\_

35.  $\sqrt{2x-3} = \sqrt{3x-2}$

\_\_\_\_\_

**V. Roots / Powers: Simplify.**

36.  $\sqrt{\frac{8}{5}}$

\_\_\_\_\_

37.  $3\sqrt{54}$

\_\_\_\_\_

38.  $2\sqrt{75} - \sqrt{48}$

\_\_\_\_\_

39.  $(3+\sqrt{7})(2-\sqrt{7})$

\_\_\_\_\_

40.  $\frac{9}{\sqrt{2}}$

\_\_\_\_\_

41.  $\frac{5^4}{5^5}$

\_\_\_\_\_

$$42. \frac{6x^2y^3}{2^{-1}x^0y^{-1}}$$

$$43. (-3r^3st^2)^3$$

$$44. \frac{25a^4b^2c}{30ab^3c}$$

---


$$45. (3x^2y^{-2}z)^{-3} (4xyz)^2$$

---


$$46. (-x^4)(-x)^5(-x)^2$$

---


$$47. \frac{5x^5y^2}{z^2} k^{-3}$$

## VI. Equations of Lines

48. Find the equation of the line passing through the points (-1, 16) and (4, 2).

48. \_\_\_\_\_

49. Write the equation of the vertical line through (2, 5)

49. \_\_\_\_\_

50. Write an equation of the line passing through (1, 3) and parallel to  $2x + 3y = -5$

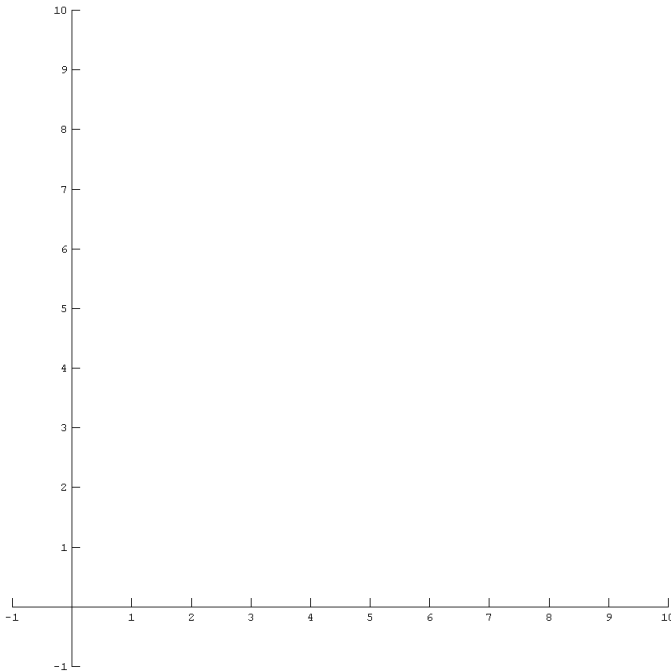
50. \_\_\_\_\_

51. Michelle has \$70 saved and spends an average of \$30 per week. Assume that she also has a babysitting job in which she earns \$20 per week.

A) Draw a graph to model this situation for a period of 5 weeks. Let  $x$  represent the number of weeks. Label your axes.

B) State the slope and  $y$ -intercept, and explain what each represents.

C) Write an equation for the line that fits this model.



**VII. Applications of Rational Expressions**

52. Working by himself, Robert can paint a house in 5 days, while, working by herself, Jennifer can paint a house in 3 days. If they work together, how long will it take them to paint 4 houses?

\_\_\_\_\_

53. Rachel ran from her house to school at an average speed of 6 miles per hour and returned along the same route at an average speed of 4 miles per hour. If the total time it took her to run to the school and back was one hour, how far is it from Rachel's house to school?

\_\_\_\_\_

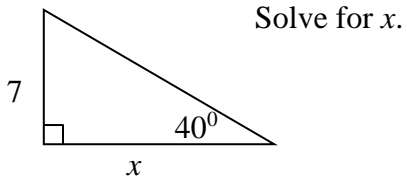
### VIII. Geometry/Right Triangle Trigonometry

54. Given the points  $(-3, 1)$  and  $(5, -7)$ , find the midpoint of the segment containing the points and the distance between the two points.

54. \_\_\_\_\_

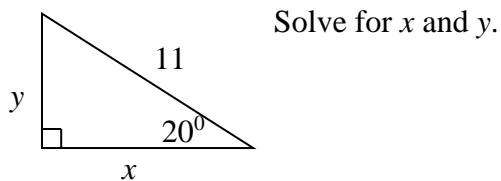
\_\_\_\_\_

55.



55. \_\_\_\_\_

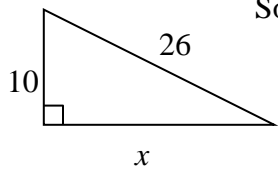
56.



56. \_\_\_\_\_



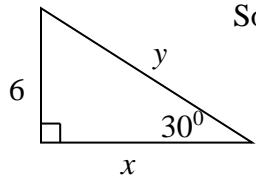
57.



Solve for  $x$ .

57. \_\_\_\_\_

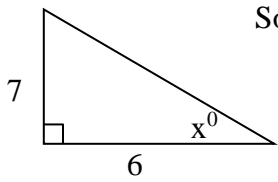
58.



Solve for  $x$  and  $y$ .

58. \_\_\_\_\_

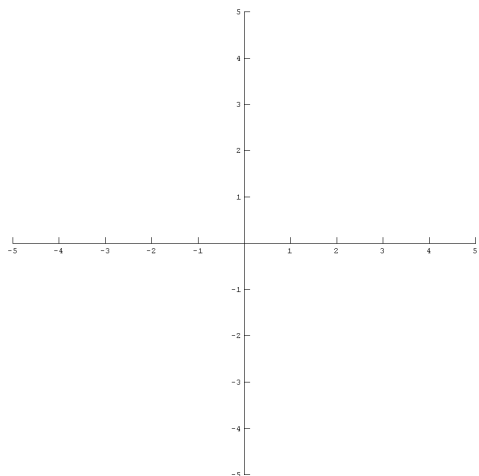
59.



Solve for  $x$ .

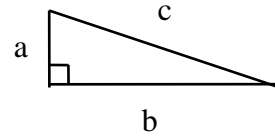
59. \_\_\_\_\_

60. Identify the type of triangle that has  $(-5, -1)$ ,  $(2, 2)$ , and  $(0, -3)$  as vertices.



**61 - 63** Use the triangle to the right, find the indicated values. Give exact answers.

61.  $a = 3\sqrt{2}$ ,  $b = 4\sqrt{3}$ , find  $c$



61. \_\_\_\_\_

62.  $b = 9$ ,  $c = 11$ , find  $a$

62. \_\_\_\_\_

63.  $a = \sqrt{10}$ ,  $b = 5\sqrt{2}$ , find  $c$

63. \_\_\_\_\_

**64 - 65** Indicate (answer yes or no) whether each of the following sets of numbers could represent sides of a right triangle. **SHOW WORK!**

64.  $4, 4\sqrt{2}, 4\sqrt{3}$

65.  $2\sqrt{2}, 6, 2\sqrt{7}$

64. \_\_\_\_\_

65. \_\_\_\_\_

**66-67. Solve the problems. SHOW WORK! Drawing a sketch might be helpful!**

66. A cable from the top of a circus tent pole is attached to the ground at a point 6 m from the base of the pole. If the cable is 44 m long, how high is the pole?

66. \_\_\_\_\_

67. For the situation described in Question 63, what is the angle of elevation from the ground to the top of the pole?