

8th Geometry Going Into Functions Honors

When starting class next year, you should have a concrete understanding of the topics listed below.

In order to help you with this, we are attaching a packet of practice that you should complete over the summer. There are problems for each of these skills and a solutions sheet at the back so you can check your solutions. All work should be completed on a separate sheet of paper and brought with you on the first day of school. Khan Academy is a great resource for videos, practice, and quizzes to help you master these. IXL also has practice that you can complete. Simply search the topic you are working on.

We hope you have a great summer and good luck in high school!

- Polynomials
 - add, subtract, multiply, and divide
- Solving Polynomial Equations
 - factoring
 - completing the square
 - quadratic formula
 - square root
- Multi-Step Equations & Inequalities
 - proportions
 - rational equations
 - absolute value equations
 - radical equations
- Radicals
 - simplifying, adding & subtracting, multiplying, dividing
 - rationalizing the denominator & conjugates
- Linear Equations
 - writing the equation of a line given 2 points, graph, table of values, point and slope
 - Slope-Intercept Form, Point-Slope Form, and Standard Form
 - equations of parallel & perpendicular lines
 - modeling linear equations
- Solving Systems of Equations
 - graphing
 - substitution
 - elimination
 - modeling (word problems)
- Properties of Exponents
- Application Problems
- Properties of Triangles
 - Right triangle trig
 - Pythagorean Theorem

**Functions
Summer Assignment**

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.

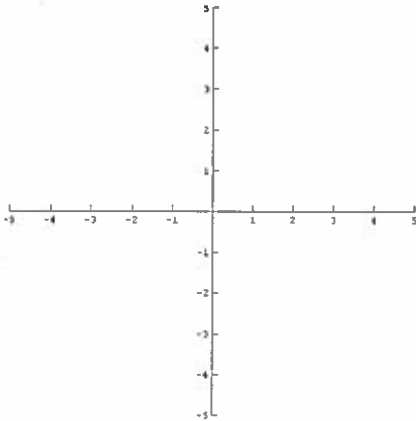
14. $5x - 2y = -22$

$5x + 3y = -17$

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.

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

$$37. 3\sqrt{54}$$

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

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

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

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

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

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

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

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

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

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

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 $2x + 3y = -5$

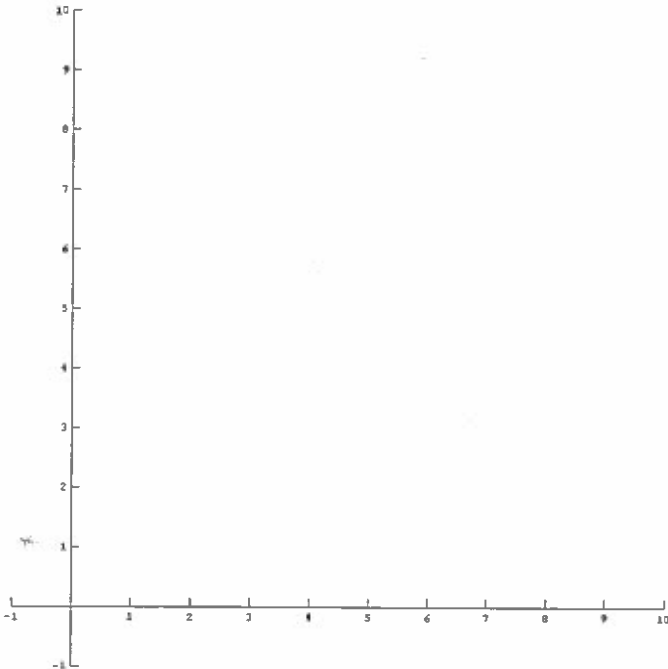
50. _____

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?

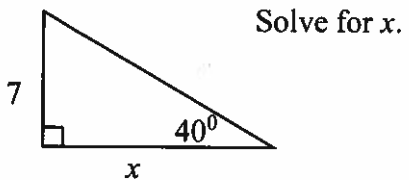
53. Rachel ran from her house to school at an average speed of 6 miles per hour and returned along the same route at an average speed of 4 miles per hour. If the total time it took her to run to the school and back was one hour, how far is it from Rachel's house to school?

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.

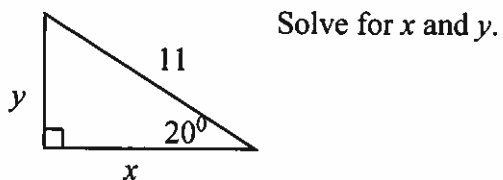
54. _____

55.



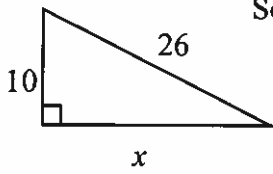
55. _____

56.



56. _____

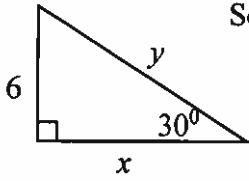
57.



Solve for x .

57. _____

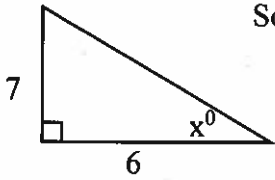
58.



Solve for x and y .

58. _____

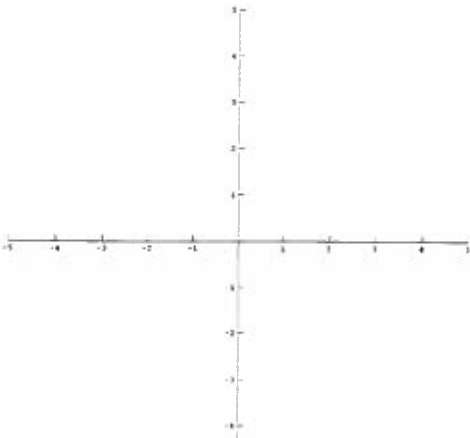
59.



Solve for x .

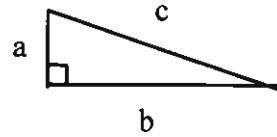
59. _____

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!

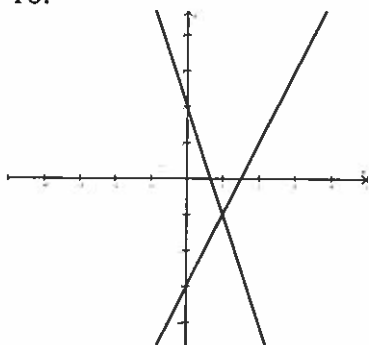
66. A cable from the top of a circus tent pole is attached to the ground at a point 6 m from the base of the pole. If the cable is 44 m long, how high is the pole?

66. _____

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

Functions 2008: Answer Key to Summer Assignment

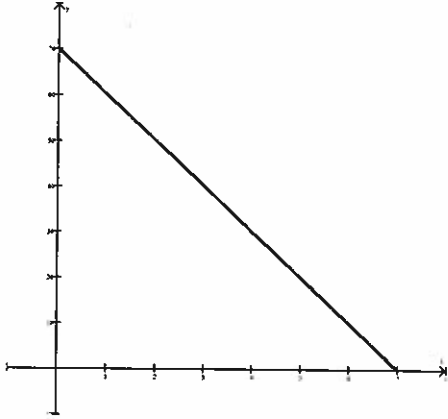
1. $(x-8)(x+3)$
2. $9(x-3)(x+3)$
3. $(x-8)(x-2)$
4. $(4a-1)(a+1)$
5. $4a^3(a-2)(a+2)$
6. $3(x^2-2x-30)$
7. $(3x+5)(x+1)$
8. $r(r-15)(r+4)$
9. $(7h-2)(h+2)$
10. $(2x-y^2)(2x+y^2)(4x^2+y^4)$
11. $(x^3+3)(x-2)$
12. $(x-y-z)(x-y+z)$
13. $(x-1)(x+1)(x^2+1)(x^4+1)$
14. $(-4,1)$
15. $(-2,3)$
- 16.



$(1, -1)$

17. 350 orchestra seats
18. 4 ounces of 50% solution, 8 ounces of 20% solution
19. $z = \frac{1}{3}$
20. $c < -5$
21. All real numbers
22. $x = \frac{5}{2}, x = -4$
23. $x = -\frac{9}{2}, x = 3$

24. $y > 3$
25. $3 < x < 6$
26. $y = 3, y = -7$
27. $-4 \leq y \leq 8$
28. $y > 6$ or $y < -10$
29. $-1 < x < \frac{2}{3}$
30. $x = 0, x = \frac{16}{7}$
31. $x = \pm \frac{3}{2}$
32. $x = 4$
33. $x = 17$
34. $y = 7$
35. No solution
36. $\frac{2\sqrt{10}}{5}$
37. $9\sqrt{6}$
38. $6\sqrt{3}$
39. $-1 - \sqrt{7}$
40. $\frac{9\sqrt{2}}{2}$
41. $\frac{1}{5}$
42. $12x^2y^4$
43. $-27r^9s^3t^6$
44. $\frac{5a^3}{6b}$
45. $\frac{16y^8}{27x^4z}$
46. x^{11}
47. $\frac{x^{15}z^6}{y^6}$
48. $y = -\frac{14}{5}x + \frac{66}{5}$
49. $x = 2$
50. $y = -\frac{2}{3}x + \frac{11}{3}$
51. a.)



b) Slope = -10 (Michelle is spending money 10 dollars/week more than she is earning) Y-Intercept = 70 (Michelle's initial amount of money)

c) $y = 70 - 10x$

52. 7.5 days
53. 2.4 miles
54. Midpoint: $(1, -3)$, Distance: $8\sqrt{2}$
55. $x = 8.34$
56. $x = 10.33, y = 3.76$
57. $x = 24$
58. $x = 6\sqrt{3}, y = 12$
59. $x = 49.39^\circ$
60. An isosceles triangle
61. $\sqrt{66}$
62. $2\sqrt{10}$
63. $2\sqrt{15}$
64. YES
65. YES
66. $\sqrt{1900} \approx 43.59$ feet
67. 82.16°