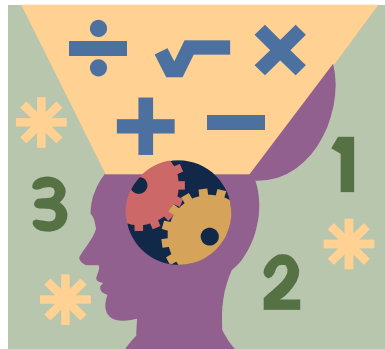


*Poe Middle School  
Rising 8<sup>th</sup> Grade  
Geometry Students  
Summer Mathematics Packet*



***Dear Students:** The purpose of this packet is to review Algebra concepts as you look forward to Geometry at Poe Middle School, next year. Please show all your work for each problem.*

*This packet will be due the first week of school in September.*

## Summer Packet – Rising Geometry Students

From the following equations, find the slope and y-intercept of each line.

1.  $y = -3x + 2$

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

3.  $3x + 2y = 14$

4.  $y = 2\left(-\frac{2}{3}x - 4\right)$

Find the slope of the line containing the given points.

5.  $(-6,7) ; (3,7)$

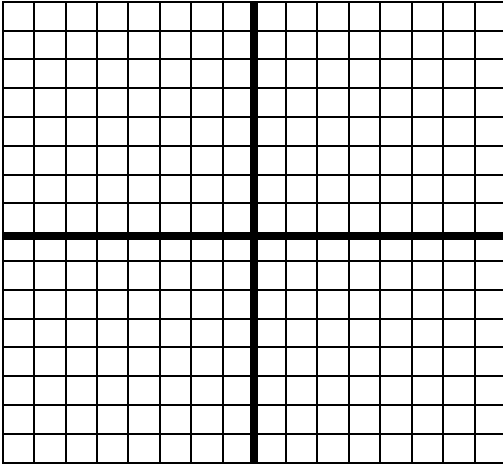
6.  $(6,-2) ; (0,5)$

7.  $(5,5) ; (20,25)$

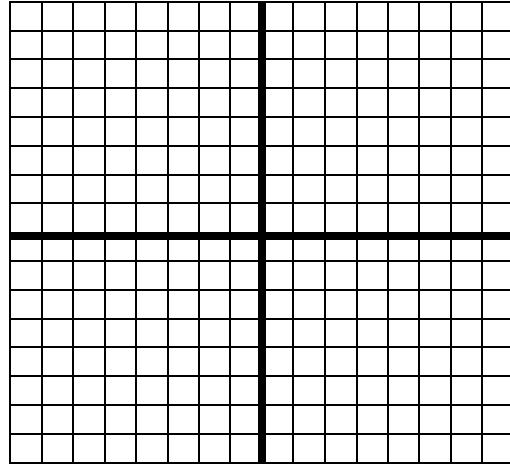
8.  $(-11,7) ; (-11,-7)$

Sketch the graphs of each line.

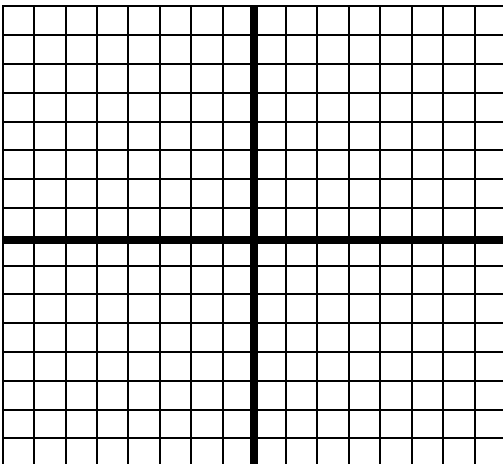
9.  $y = -3x + 1$



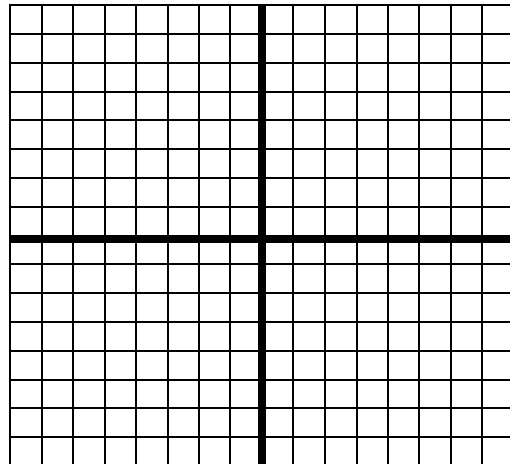
10.  $y = \frac{1}{4}x - 2$



11.  $y = \frac{2}{3}x - 3$



12.  $y = -x + 3$



Write the equation, in point-slope form, of the line that contains the given point and has the given slope.

13.  $(-5, 6)$ ,  $m = 7$

14.  $(8, 9)$ ,  $m = -2$

15.  $(0, 3)$ ,  $m = \frac{1}{2}$

16.  $(4, -9)$ ,  $m = 0.8$

Write the equation, in slope-intercept form, of the line that contains the given point and has the given slope.

17.  $(7, -5)$ ,  $m = \frac{4}{7}$

18.  $(0, -3)$ ,  $m = -2$

19.  $(6, 0)$ ,  $m = \frac{3}{5}$

20.  $(-14, 9)$ ,  $m = -\frac{1}{2}$

Write an equation, in standard form, of the line that contains the given pts.

21.  $(0,6)$  ,  $(4,9)$

22.  $(37, -19)$  ,  $(56, 19)$

23.  $\left(\frac{2}{3}, -1\right)$  ,  $\left(\frac{4}{9}, 7\right)$

24.  $(12,9)$  ,  $(7,-11)$

Find the vertex for the graph of each.

25.  $y = |x+3| - 6$

26.  $y = |2x-4| - 9$

27.  $y = \frac{1}{2}|x+4| + 4$

28.  $y = -3|x+6| + 1$

Solve each inequality and sketch its graph (on a number line).

29.  $|x-2| < 4$

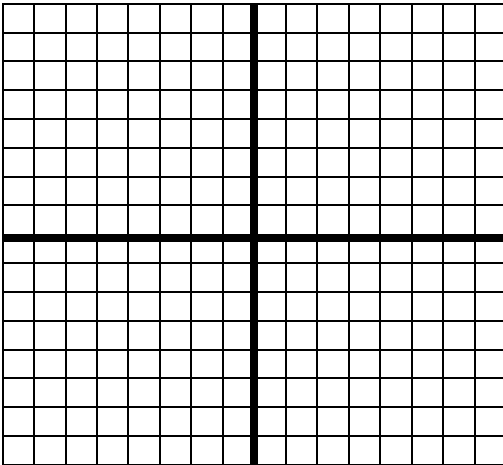
30.  $|4x-6| \leq 4$

31.  $\left| \frac{1}{4}x + 2 \right| > 1$

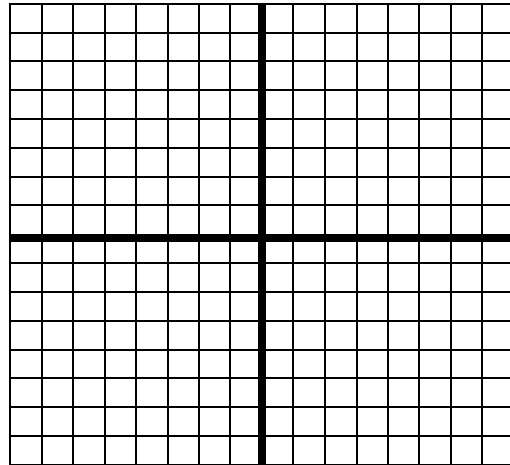
32.  $-\frac{2}{3}|x+5| - 1 \geq -11$

Sketch the graph of each in equality.

33.  $-2x + 3y \geq x + 9$

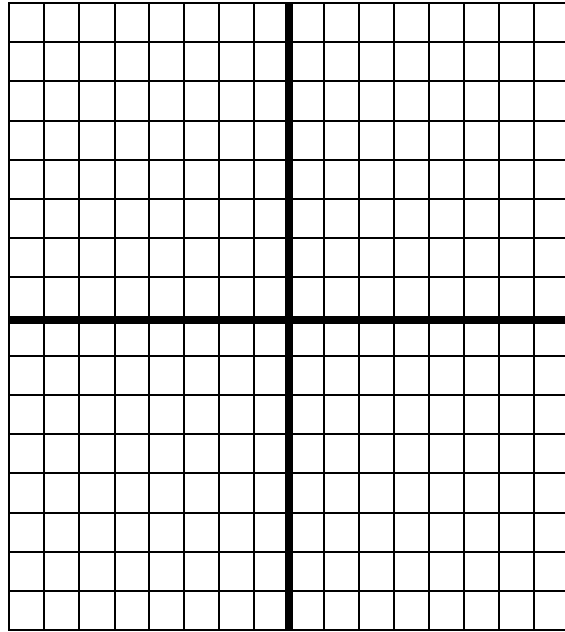
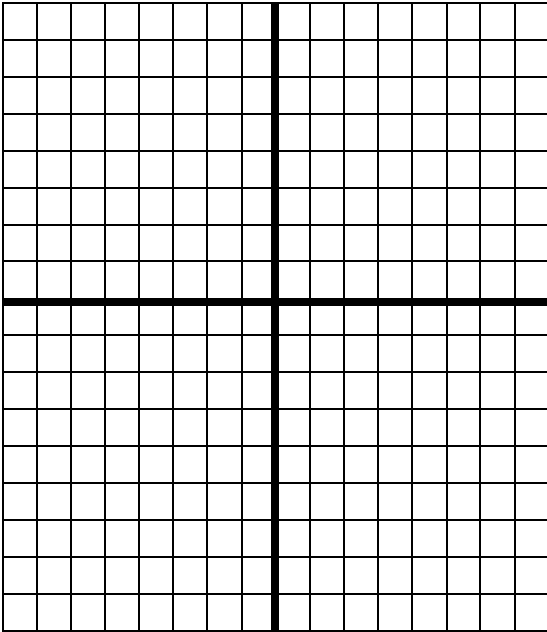


34.  $\frac{1}{2}x + 2y > 4$



35.  $-0.5(2x + y) < 1$

36.  $-y \geq 3x - 1$



Do what is indicated for each of the following.

37. Write an equation for a line that is perpendicular to the line for  $y = 3x + 2$ .

38. In 1990, the population of South Carolina was approximately 3,500,000. During the next ten years, the population increased by approximately 38,500 people per year. Write a linear model (equation) that gives the population,  $P$ , of South Carolina in terms of the year,  $T$ . Let  $T = 0$  correspond to 1990.



39. Chezwick's Car Rental charges a flat fee of \$50 and \$0.45 per mile to rent an SUV. Write a linear model that gives the total cost in terms of the number of miles driven.

40. Milo's T-Shirt Store made a profit of \$25,000 in 1999 and a profit of \$33,000 in 2003. Write an equation that gives the profit,  $P$ , in terms of year,  $x$ . Let  $x = 0$  correspond to **1998**.

41. You are buying \$24 worth of peanuts and cashews for a party. The peanuts cost \$3 per pound, and the cashews cost \$4 per pound. Write an equation for the different amounts of peanuts and cashews that you can buy.

42. You plan on landscaping your yard. You decide to use two types of mulch: Sierra red and plain brown. Sierra red costs \$7 per bag and the plain brown costs \$4 per bag. You purchase 15 bags of mulch which costs \$84. How many bags of each type did you purchase?

Perform the indicated operation (to simplify).

43.  $3x(x^2 + 3x - 4)$

44.  $(x + 2)(2x - 1)$

45.  $(2x + 5)(2x - 5)$

46.  $(4x^2 + 2)(3x^1 + 6 - 5^0)$

47.  $(2x + 7)^2$

48.  $(6x - 7)^2$

Solve by factoring.

49.  $x^2 - 6x - 27 = 0$

50.  $x^2 - 12x + 35 = 0$

51.  $3n^2 + 18n = 0$

52.  $3m^2 + 8m - 4 = 12$

Solve using the Quadratic Formula.

53.  $x^2 + 3x - 5 = 0$

54.  $x^2 - 6x = -7$

55.  $2x^2 - 12x + 7 = 0$

56.  $3x^2 - 24x = -6$

Simplify.

57.  $\frac{3h}{4} \cdot \frac{2}{6h^3}$

58.  $\frac{x-2}{3x} \div \frac{4}{15x^2}$

59.  $\frac{m^2 - 2m}{m^2 - 4m + 4}$

60.  $\frac{3n^2 - 2n - 5}{n+1} \cdot \frac{n^2}{3n-5}$

Solve.

$$61. \frac{5}{x+3} = \frac{6}{x+1}$$

$$62. \frac{x+5}{3} = \frac{2}{x}$$

$$63. \frac{y-6}{2} = \frac{-3}{y-1}$$

$$64. \frac{x+5}{x-8} = \frac{1}{3x}$$

$$65. \frac{x+3}{x+5} = \frac{x-3}{-5}$$

$$66. \frac{7}{10} = \frac{9+x}{x}$$

$$67. \frac{x^2-16}{x+4} = \frac{x-4}{3}$$

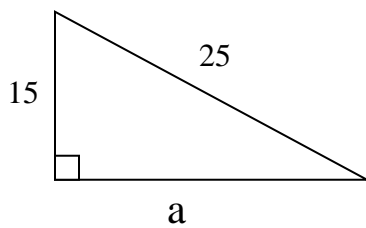


72. Ms. Lopez needs to make 70 milliliters of a 25% acid solution by mixing together a 15% acid solution with a 40% acid solution. How much of each solution must she use?
73. A boat went 15 miles upstream in 1 hr. The trip back took 30 min. Find the speed of the boat and the speed of the current (water).
74. Fred lives in Pennsylvania and his grandmother lives in Ohio. When driving to visit her, Fred's average speed in Pennsylvania is 55 mph. When he is in Ohio, his average speed is 65 mph. It takes Fred 5 hours to complete the 295-mile trip (one-way). How long does he drive in each state?

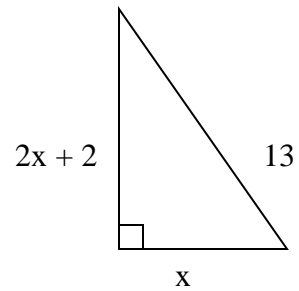
75. Do the following three sides form a right triangle---  $a = 9$ ,  $b = 12$ , and  $c = 15$ ? Show work.

For problems 76 and 77, find the missing sides:

76.

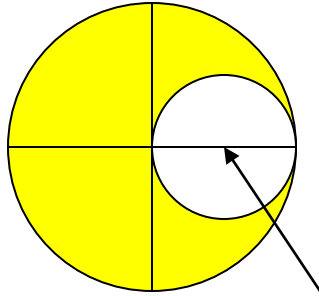


77.



78. A certain park is in the shape of a rectangle. It covers an area of 120,000 square yards. The length of the park is 400 yards. If you were to run diagonally from one corner of the park to another, how far would you have run?

79.



The diameter of the white (small, interior) circle is 10 inches. How many square inches are shaded in yellow? Round your answer to the nearest whole number.

80. Describe the graph of  $y = -2x^2 + 4x + 1$ . What is it called? Where is its vertex? How does it open? What are the x- and y-intercepts?