

Name: \_\_\_\_\_

**Math Summer Work Packet: Geometry**  
**Due on the first Day of class in September**

1. What is the *minimum* value of the function  $y = |x + 3| - 2$ ?

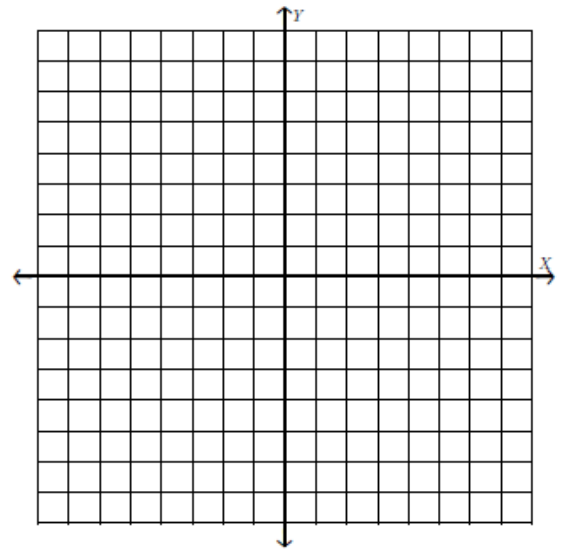
2. In attempting to solve the system of equations  $y = 3x - 2$  and  $6x - 2y = 4$ , John graphed the two equations on his graphing calculator. Because he saw only one line, John wrote that the answer to the system is the empty set. Is he correct? Explain your answer.

3. A typical marathon is 26.2 miles. Allan averages 12 kilometers per hour when running in marathons.

Determine how long it would take Allan to complete a marathon, to the *nearest tenth of an hour*. Justify your answer.

4. Graph the inequality  $y > 2x - 5$  on the set of axes below.

State the coordinates of a point in its solution.



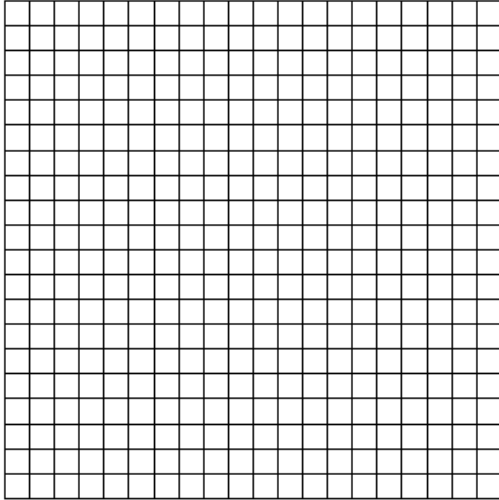
5. Nora says that the graph of a circle is a function because she can trace the whole graph without picking up her pencil.

Mia says that a circle graph is *not* a function because multiple values of  $x$  map to the same  $y$ -value.

Determine if either one is correct, and justify your answer completely.

6. Graph  $f(x) = |x|$  and  $g(x) = -x^2 + 6$  on the grid below.

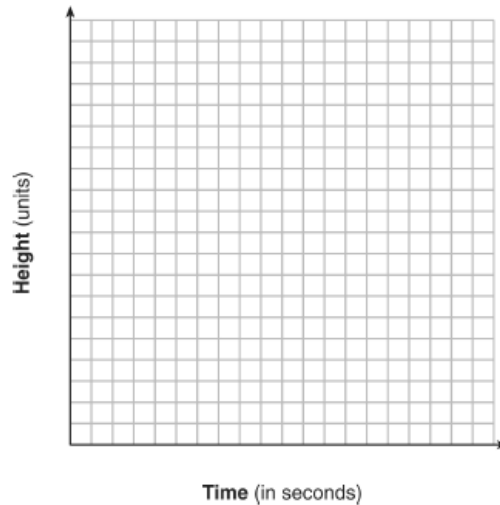
Does  $f(-2) = g(-2)$ ? Use your graph to explain why or why not.



7. Two friends went to a restaurant and ordered one plain pizza and two sodas. Their bill totaled \$15.95. Later that day, five friends went to the same restaurant. They ordered three plain pizzas and each person had one soda. Their bill totaled \$45.90.

Write and solve a system of equations to determine the price of one plain pizza. [Only an algebraic solution can receive full credit.]

8. Alex launched a ball into the air. The height of the ball can be represented by the equation  $h = -8t^2 + 40t + 5$ , where  $h$  is the height, in units, and  $t$  is the time, in seconds, after the ball was launched. Graph the equation from  $t = 0$  to  $t = 5$  seconds.



State the coordinates of the vertex and explain its meaning in the context of the problem.

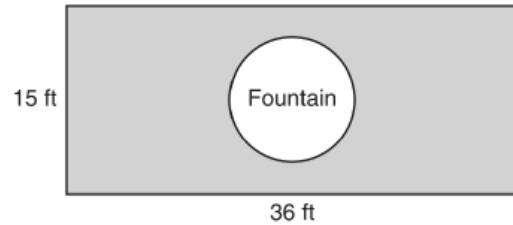
9. Write a quadratic equation in standard form that has roots of  $-12$  and  $2$ .
10. Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation  $y = -x^2 - 2x + 1$ .

11. The length of a rectangle is represented by  $x^2 + 3x + 2$ , and the width is represented by  $4x$ .

Express the perimeter of the rectangle as a trinomial.

Express the area of the rectangle as a trinomial.

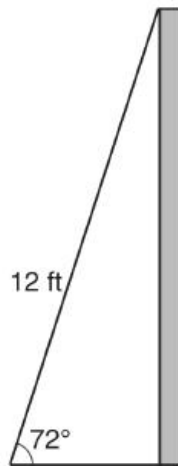
13. The Rock Solid Concrete Company has been asked to pave a rectangular area surrounding a circular fountain with a diameter of 8 feet, as shown in the diagram.



Find the area, to the *nearest square foot*, that must be paved.

Find the cost, *in dollars*, of paving the area if the Rock Solid Concrete Company charges \$8.95 per square foot.

12. As shown in the diagram below, a ladder 12 feet long leans against a wall and makes an angle of  $72^\circ$  with the ground.



Find, to the *nearest tenth of a foot*, the distance from the wall to the base of the ladder.

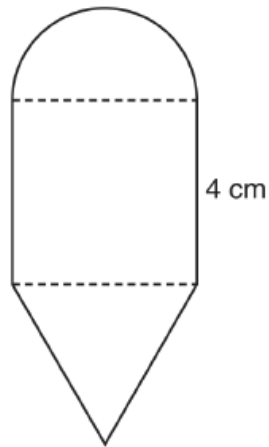
14. When  $9x^2 - 100$  is factored, it is equivalent to  $(3x - b)(3x + b)$ . What is a value for  $b$ ?

15. What is the slope of a line passing through points  $(-7, 5)$  and  $(5, -3)$ ?

16. A parking lot is 100 yards long. What is the length of  $\frac{3}{4}$  of the parking lot, in feet?

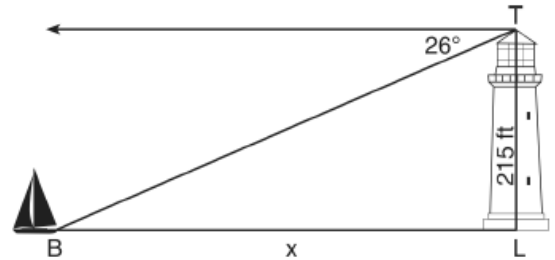
|                 |
|-----------------|
| 1 yard = 3 feet |
|-----------------|

17. The diagram below consists of a square with a side of 4 cm, a semicircle on the top, and an equilateral triangle on the bottom. Find the perimeter of the figure to the *nearest tenth of a centimeter*.

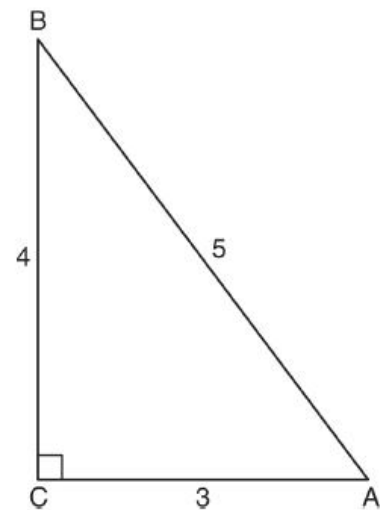


18. A thermos in the shape of a cylinder is filled to 1 inch from the top of the cylinder with coffee. The height of the cylinder is 12 inches and its radius is 2.5 inches. State, to the *nearest hundredth of a cubic inch*, the volume of coffee in the thermos.

19. The top of a lighthouse,  $T$ , is 215 feet above sea level,  $L$ , as shown in the diagram below. The angle of depression from the top of the lighthouse to a boat,  $B$ , at sea is  $26^\circ$ . Determine, to the *nearest foot*, the horizontal distance,  $x$ , from the boat to the base of the lighthouse.



20. Which ratio represents the cosine of angle  $A$  in the right triangle below?



21. A jogger ran at a rate of 5.4 miles per hour. Find the jogger's *exact* rate, in feet per minute.

|                                       |
|---------------------------------------|
| $1 \text{ mile} = 5,280 \text{ feet}$ |
|---------------------------------------|

22. The "Little People" day care center has a rectangular, fenced play area behind their building. The play area is 30 meters long and 20 meters wide. Find, to the *nearest meter*, the length of a pathway that runs along the diagonal of the play area.

23. Write an equation of the straight line whose slope is 2 and whose y-intercept is the same as that of the line represented by the equation  $y = 4x - 2$ .

24. The line that passes through point  $(-1, 4)$  and point  $(6, y)$  has a slope of  $\frac{5}{7}$ . Find  $y$ .

25. In a right triangle, one leg is 3 more than the other, and the hypotenuse is 3 less than twice the shorter leg. Find the numerical value of the perimeter of this triangle.