

Math-8 Exam #3

Name: _____

This exam is closed book and notes. You may use a calculator; however, no other electronics are allowed. Show all work; there is no credit for guessed answers. All answers should be in exact values, unless you are specifically asked for an approximate value.

- 1). Identify each of the following formulas. Be very specific. Differentiate between general and standard forms and call out important points (like the center of a circle).

$$d = [(x_1 - x_2)^2 + (y_1 - y_2)^2]^{1/2}$$

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$y - y_1 = m(x - x_1)$$

$$y = mx + b$$

$$m_1 = m_2$$

$$m_1 m_2 = -1$$

$$(x - h)^2 + (y - k)^2 = r^2$$

$$x^2 + y^2 + Dx + Ey + F = 0$$

- 2). You have two dogs: Fido and Fluffy. Each dog is tied to its own stake in your backyard by a leash. Fido's stake and leash allow him to roam around an area defined by:

$$(x - 2)^2 + (y - 1)^2 = 9$$

What are the coordinates of Fido's stake and the length of his leash?

- 3). Fluffy's stake and leash allow her to roam around an area defined by:

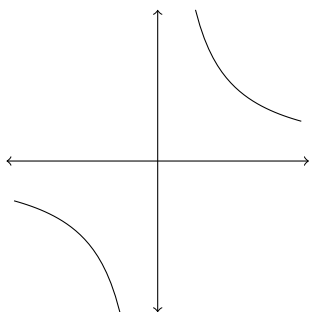
$$x^2 + y^2 - 10x - 8y + 37 = 0$$

What are the coordinates of Fluffy's stake and the length of her leash?

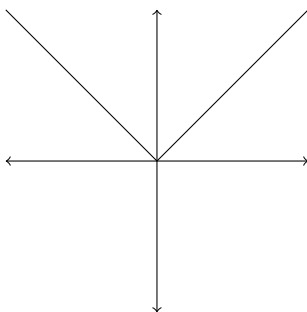
- 4). What is the equation of the line between the two stakes, in slope-intercept form?

- 5). It is mating season. Fido and Fluffy are not fixed; however, you do not want them to mate. To be safe, you decide to erect a straight wall that is perpendicular to the line joining the two stakes and going through the midpoint of that line. What is the equation of the wall, in slope-intercept form?

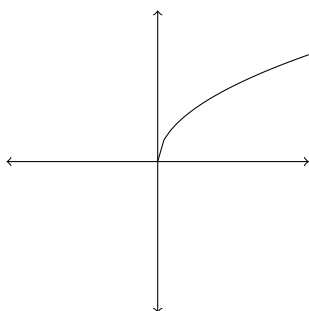
6). Identify each of the following standard functions:



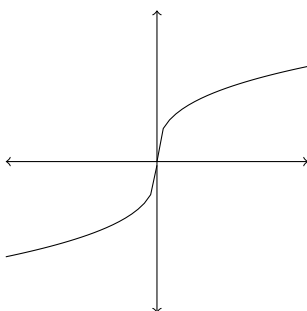
$y =$



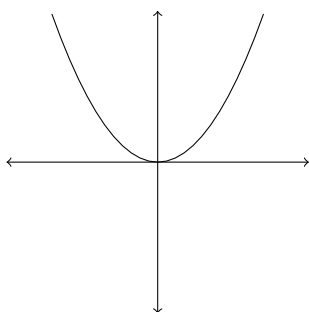
$y =$



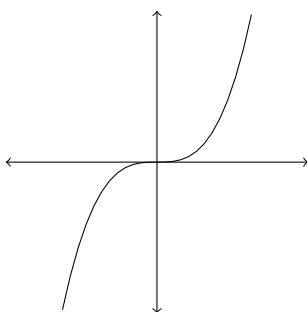
$y =$



$y =$



$y =$



$y =$

7). Consider the function:

$$f(x) = -(x - 1)^2 + 4$$

Identify the initial standard function and then the three transformations in the order that they should be applied.

a).

b).

c).

d).

8). For the function in (7):

a). Determine the x-intercept(s) (if any).

b). Determine the y-intercept(s) (if any).

c). Sketch the graph. Be sure to label all key points for full credit!

9). Based on your graph in (8):

a). Where is the function increasing, if anywhere (in interval notation)?

b). Where is the function decreasing, if anywhere (in interval notation)?

c). Identify any minima.

d). Identify any maxima.

10). Based on your graph in (8):

a). State the domain, in interval notation.

b). State the range, in interval notation.