# Math-19 Exam #2

Name: _____

This exam is closed book and notes. You may use a calculator; however, no cell phones or tablets are allowed. Show all work; there is no credit for guessed answers. All values should be exact with no decimals unless you are specifically asked for an approximate or decimal answer.

1). (10 points) 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).

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

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

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

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

$y = mx + b$ _____

$Ax + By + C = 0$ _____

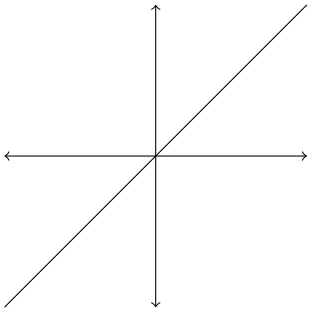
$m_1 = m_2$ _____

$m_1 m_2 = -1$ _____

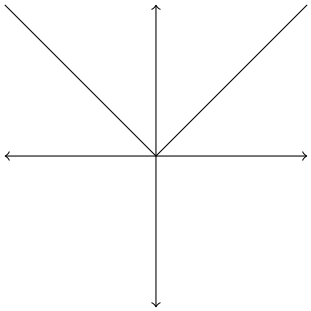
$(x - h)^2 + (y - k)^2 = r^2$ _____

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

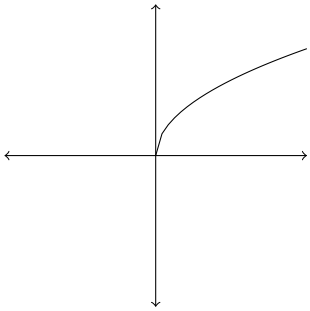
2). (10 points) Identify each of the following standard functions:



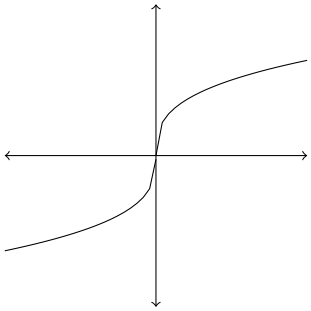
$y =$



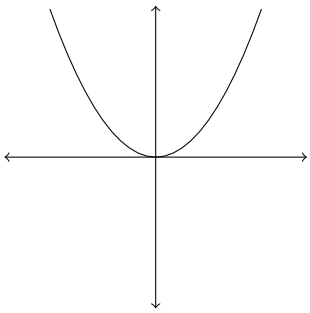
$y =$



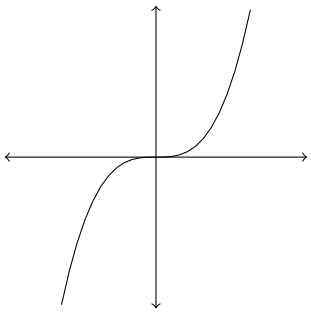
$y =$



$y =$



$y =$



$y =$

3). (10 points) You own a candy and nut store. Peanuts sell for \$4.00 per lb and cashews sell for \$7.50 per lb. Unfortunately, the more expensive cashews are not selling very well, so you decide to make a peanut/cashew mix. You mix 10 lb of peanuts with 10 lb of cashews. How much should you charge per pound for the mix?

4). (10 points) Consider the inequality: $x^2 - 7x - 18 < 0$.

a). Solve for $x$. Your answer should be in interval notation and should have an accompanying graph.

b). Construct the corresponding absolute value inequality.

5). (20 points) A new rock band is performing at the SJSU event center. The band wants to spread some posters around town advertising the performance. The printer says that the cost to print each poster varies directly with the area of the poster and inversely with the number of posters ordered.

a). Let $P =$ the cost to print each poster, $A =$ area of each poster and $n =$ number of posters printed. Write an equation that expresses the cost of each poster in terms of $A$ and $n$.

b). What is the value of the constant of proportionality if the price per poster is \$4 when printing 100 posters of size 80 square inches each?

c). The band decides that they would like the posters to be a bit bigger and that they don't need 100 of them. How much is the price per poster when printing 80 posters of size 160 square inches each?

6). (20 points) 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:

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

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

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

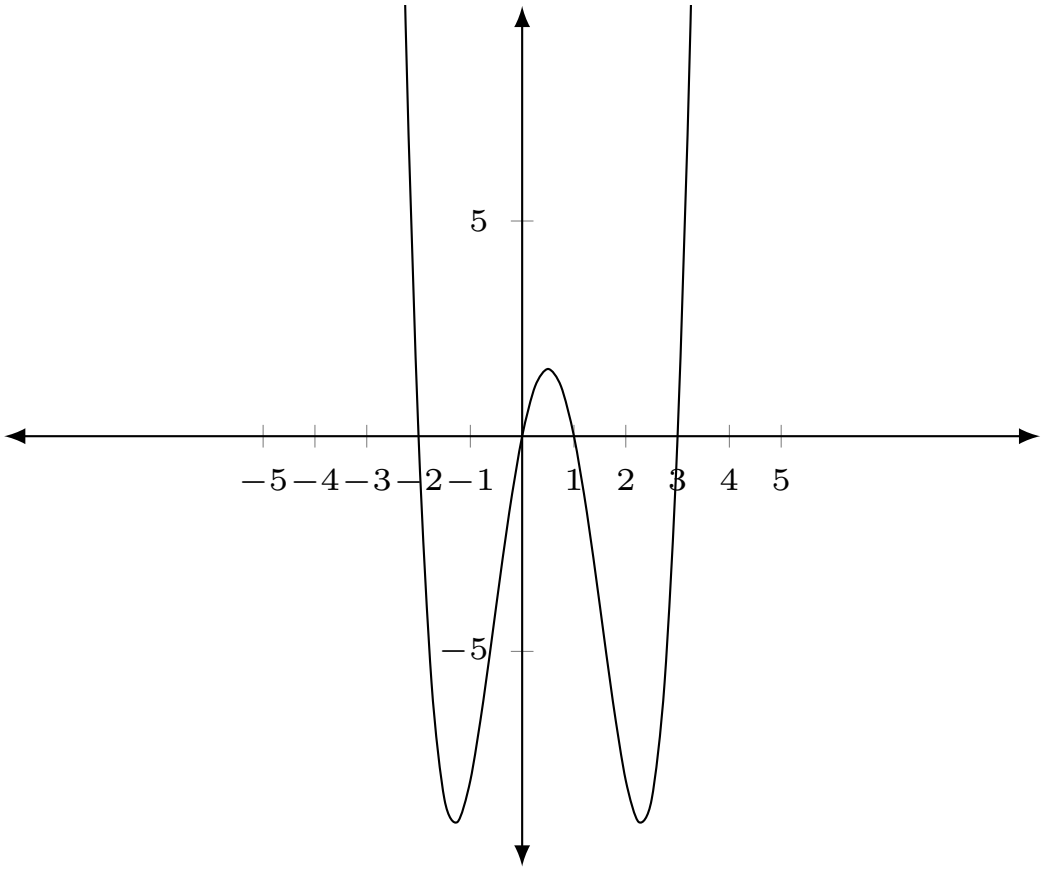
a). What are the coordinates of Fido's stake and the length of his leash?

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

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

d). It is mating season. Fido and Fluffy and not fixed, but 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?

7). (20 points) Below is the graph for the polynomial function $f(x) = x(x-1)(x+2)(x-3)$.




a). Is this a function? If so, why?

b). What is $f(-1)$?

c). What are the $x$-intercepts (if any)?

d). What are the $y$-intercepts (if any)?

e). Use your calculator to determine all of the local maxima (if any). Round all answers to one decimal point.

f). Use your calculator to determine all of the local minima (if any). Round all answers to one decimal point.

g). What is the domain?

h). What is the range?

i). Where is the function increasing (in interval notation)?

j). Where is the function decreasing (in interval notation)?