MATH 30 - Precalculus. Homework 3. Due Th. 02/21/2019. Professor Luis Fernández

NAME:_____

Write your answers in other sheets and/or the graph paper provided and **STAPLE this one to your other sheets.**

1. Recall that to show that a function g is the inverse of a function f one needs to show that $f(g(x)) = x$ and that $g(f(x)) = x$. To do this,

1. Find $f(g(x))$ and simplify and see that you get x.
2. Find $g(f(x))$ and simplify and see that you get x.

For the following, show that g is the inverse of f.

a) $f(x) = 4x - 7$ and $g(x) = \dfrac{x+7}{4}$.

b) $f(x) = \dfrac{2}{x-5}$ and $g(x) = \dfrac{2}{x} + 5$.

c) $f(x) = -3x + 1$ and $g(x) = \dfrac{x-1}{-3}$.

d) $f(x) = \dfrac{x-2}{2x+1}$ and $g(x) = \dfrac{-x-2}{2x-1} + 5$.

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2. Find the inverse of the following functions.

a) $f(x) = 2x - 1$

b) $g(x) = \dfrac{1}{x} + 1$

c) $h(x) = x^2 - 4$, with domain $(-\infty, 0]$ (so $x \leq 0$)

d) $i(x) = \dfrac{x-1}{x+1}$.

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3. Recall that the range of a function is the domain of its inverse. Using this fact, find the range of the functions f, g and h of the previous exercise.

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4. For the following quadratic functions,

- Find the vertex and x- and y-intercepts.
- Draw the graph in the graph paper provided (or on your own graph paper).
- Give the equation of the axes of symmetry.
- Determine the function's domain and range.

a) $f(x) = (x-4)^2 - 1$.

b) $g(x) = 4 - (x-1)^2$.

c) $h(x) = 3x^2 - 2x - 4$.

d) $i(x) = 2x - x^2 - 2$.

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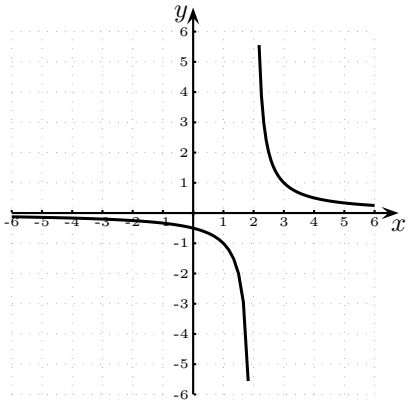
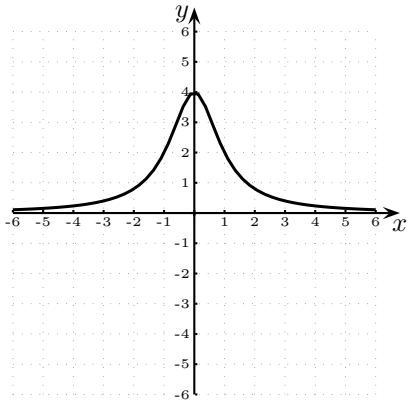
5. [BONUS] Use a graphing device to find functions whose graphs look roughly like the following. (HOW? Play!)

a)



b)



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6. Find an angle between 0 and 2π that is coterminal with the following angles:

a) $\dfrac{27\pi}{4}$

b) $\dfrac{7\pi}{4} + 5\pi$

c) $\dfrac{-13\pi}{3}$