Math 2 Quiz #3
In-class Thursday, 3/8/18
Name ____________________________

No notes, text or calculator.
To receive full credit, all work that leads to your answers must be clearly shown.

1. Given \( y = f(x) = \frac{x-4}{3x+1} \) In order to find the range \( R \) of this function, do the following parts a) & b).
   a) Solve for \( x \) in terms of \( y \). Circle your answer. (5 pts.)
   \[
   (3x+1)(y) = (\frac{x-4}{3x+1})(3x+1) \\
   3xy + y = x - 4 \\
   y + 4 = x - 3xy \\
   y + 4 = x(1 - 3y) \\
   \]

   \[
   Sc, \quad \frac{y+4}{1-3y} = x \\
   Den: 1-3y \neq 0 \quad 1+3y \neq 0 \\
   y \neq \frac{1}{3} \\
   \]

   b) Find the range of \( f \). (2 pts.)
   \( R_f = \left\{ y \mid y \neq \frac{1}{3} \right\} \)

2. Below is given the graph of a function \( y = f(x) \). Use the graph to answer the following. (1 pt. each)
   a) Is this function even or odd or neither? \( \text{even} \)
   b) Is \( f(-1) \) positive or negative or zero? \( \text{positive} \)
   c) Is this function continuous? \( \text{yes} \)
   d) Is this function 1-1? \( \text{no} \)
   e) For \( x < -2 \), is \( f \) increasing or decreasing or neither? \( \text{Inc.} \)
   f) How many turning points does the graph have? \( 3 \)
   g) What is the maximum functional value, if any? \( y = 4 \)

3. Given \( y = f(x) = \sqrt{x} \)
   Which of the following will be the \( f \) graph shifted left 4 units? Circle your answer. (2 pts.)
   a) \( y = \sqrt{x-4} \)  b) \( y = \sqrt{x+4} \)  c) \( y = \sqrt{x} - 4 \)  d) \( y = \sqrt{x} + 4 \)  e) none of these

4. The graph of \( y = f(x) \) is given below. Use the shape of this \( f \) graph to sketch the graph of \( y = f(x) - 1 \). Label at least one point on the graph you sketch. (4 pts.)