PreCalculus Unit 1 Review (Practice Test)   DATE: _____
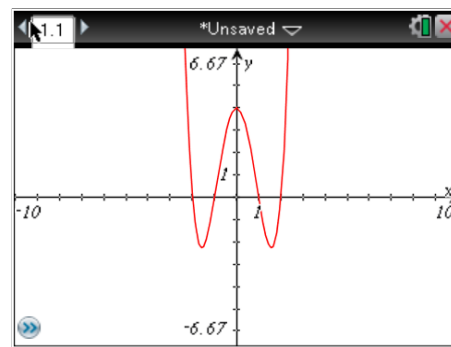
Non-Calculator

1) Using the graph on the right, estimate the relative max and min.

2) Find the domain and range of the following:
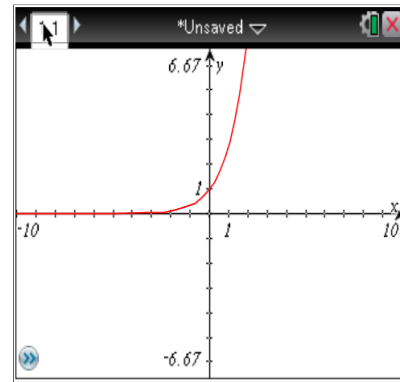   a) $f(x) = \sqrt{x-1} + 3$ b) $k(x) = \sqrt{-2x+1}$

3) Find $(f+g)(x)$ and $(g-f)(x)$ if $f(x) = x^3 - 3x + 5$ and $g(x) = x^2 - 5x - 6$.

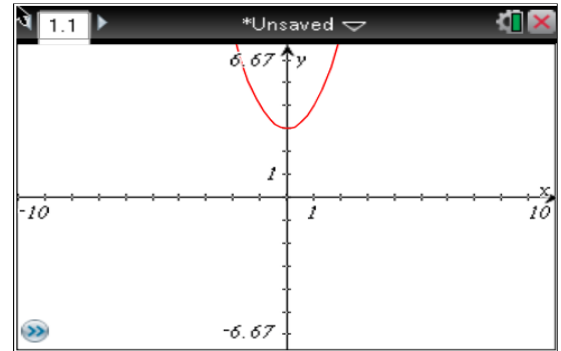4) Find $(fg)(x)$ if $f(x) = (x+3)^2$ and $g(x) = x - 3$.

5) Find $(f \circ g)(x)$ and $(g \circ f)(x)$ if $f(x) = x^2 - 7$ and $g(x) = \sqrt{x+3}$.

6) Find the inverse of $h(x) = (x-3)^2 + 9$.

7) Find the parent function that produces the graph on the right.

8) Find the function that produces the graph on the right.

9) Sketch a graph of 3 functions that are NOT continuous over the Real Numbers.

10) Sketch a graph of 3 functions that are decreasing on the interval $(-\infty, 0)$.

11) Sketch the following:

   a) graphs of 3 functions that are bounded below
   b) graphs of 2 bounded functions
   c) a graph of a function that's NOT bounded

12) Describe the transformation of $q(x) = (x - 3)^2 - 5$.

Calculator

13) Find the zeroes of $f(x) = x^2 - 5x + 3$. What is the domain and range of this function?

14) Determine a function that has zeroes @ $\frac{2}{3}, 3, and\ 5$.

15) What is the end behavior in problem 14?

16) Determine to 3 decimal places the interval(s) on which the function in problem 14 is decreasing and increasing.

17) Perform the following transformation: Reflect $q(x)$ across the x-axis if $q(x) = (x-3)^2 - 5$. Write the new function and call it $p(x)$.

18) What is the best fit regression curve given the data on the right?

# of minutes	3	4	5	6	8
# of cars	8	15	24	35	63

19) Graphite Inc. makes tennis racquets. If each racquet costs $53 to make with fixed overhead costs of $567,000, what is the best fit regression curve?

20) Clearly identify and state the x-value(s) where the discontinuities occur for:

$$f(x) = \frac{x(x^2-4)}{x^3-2x^2-8x}$$

21) Tell whether each of the following functions is odd, even, or neither:

a) $f(x) = \frac{x^3}{4-x^2}$

b) $g(x) = x^2 - 3$

c) $h(x) = x^2 - 2x - 2$