Name _____ Chapter 2 Test

Remember, you must show all the work needed for each problem to receive full credit. The work must be correct and your problems must be simplified completely.

1) (**8 points**) Find the average rate of change for the function $f(x) = 2x^2 - 6x + 1$ over the interval [2, 5]

2) (**8 points**) Find the average rate of change for the function $f(x) = \sqrt{8x + 1}$ over the interval [1, 6]

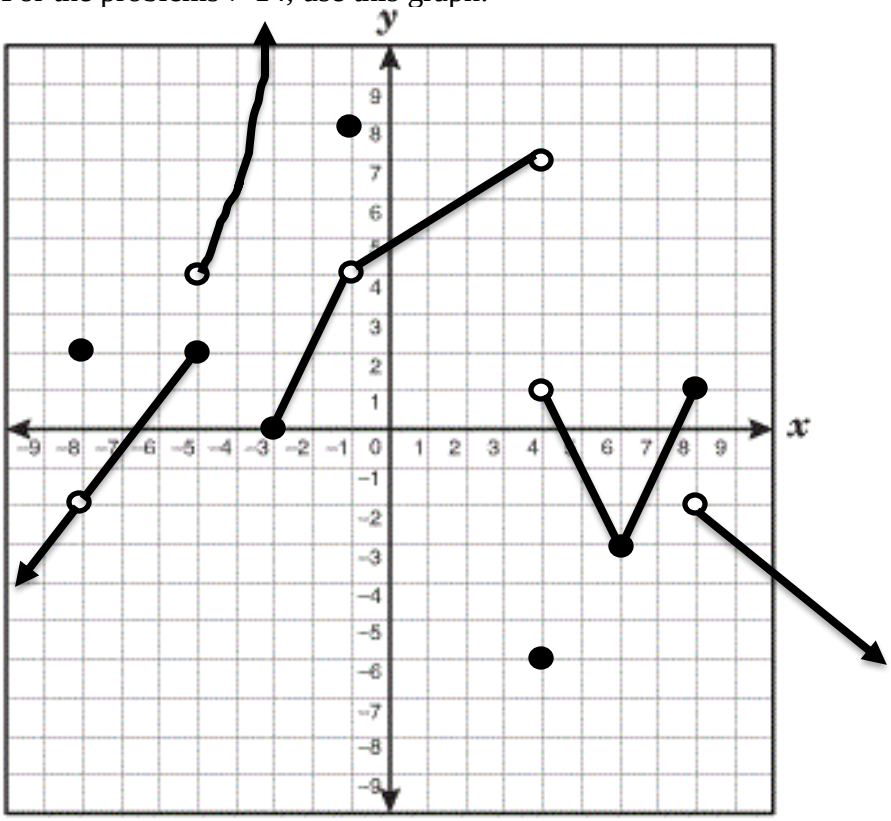
3) (**6 points**) $\lim_{x \to 2} \frac{x^2 - 12x + 20}{x - 2} = ?$

4) (7 **points**) $\lim_{x \to -\pi} 14 - 9\,(\csc x)\,(\tan x)$ = ?

5) (**7 points**) $\lim_{x \to 4} \left(\frac{\sqrt{x^2+9} - 5}{x-4} \right)$

6) **(5 points**) At which points is the function f(x) = $\sqrt{8x - 300}$ continuous?

For the problems 7-14, use this graph:



(**Each problem (7 – 13) is worth 3 points**)

7) Lim f(x) = ?
   $x \to -3^-$
8) Lim f(x) = ?
   $x \to 4^-$
9) Lim f(x) = ?
   $x \to -1$
10) Lim f(x) = ?
    $x \to -8^+$
11) Lim f(x) = ?
    $x \to -5$
12) Lim f(x) = ?
    $x \to 6^+$
13) Lim f(x) = ?
    $x \to -2$
14) (**6 points**) Using the graph above, state all the locations where this function is discontinuous. Once identified, list the type of discontinuity and if it is left continuous, right continuous, or neither.

15) (**8 points**) $\lim_{x\to\infty} \frac{5x^4-20x^{\left(\frac{13}{3}\right)}}{1-5x^4} = ?$

16) (**8 points**) Lim $\frac{88x + 1}{\sqrt{400x^2 + 16}}$ = ?
x→∞

17) (**8 points**) $\lim_{x\to-\infty} \frac{33x-1}{\sqrt{81x^2+9}}$

18) (**8 points**) Find an open interval about x_0 on which the inequality $|f(x) - L| < \varepsilon$ holds. Then give a value for $\delta > 0$ such that all x satisfying $0 < |x - x_0| < \delta$ the inequality $|f(x) - L| < \varepsilon$ holds.
Given: $f(x) = 3x + 11$ $L = 5$ $x_0 = -2$ $\varepsilon = 0.25$

Extra Credit:
(**8 points**) Using the Bisection Method and the Intermediate Value Theorem, find a contained inside an interval of length $\frac{1}{2}$ given the following information:
$f(x) = x^3 + 6x^2 - 20$ with the starting interval [0,2]