AP Calculus - Summer Work Name_____

Assignment 1

For each of the problems in this assignment, all work should be shown that leads to the final answer. These and subsequent problems are provided for you to practice your ALGEBRA skills.

For each problem, find the average rate of change (slope) of the function over the given interval.

1) $y = x^2 + x - 1;\ \ [-3, 0]$

2) $y = -x^2 + x + 1;\ \ [-1, 0]$

3) $y = \frac{1}{x};\ \ [1, 3]$

4) $y = -\frac{1}{x-1};\ \ [-2, -1]$

For each problem, find the open intervals where the function is increasing and decreasing. Graph each function to verify your answers.

5) $y = \frac{x^2}{2} + 3x + \frac{5}{2}$

6) $y = x^2 + 8x + 18$

7) $y = -2x^2$

Find the intervals on which each function is continuous (no breaks). Explain why the breaks are where they are or why there aren't any.

8) $f(x) = \frac{x-5}{x^2 - x - 2}$

9) $f(x) = -x^4 + 4x^2 + x$

Answers to Assignment 1

1) -2

2) 2

3) $-\frac{1}{3}$

4) $\frac{1}{6}$

5) Increasing: $(-3, \infty)$ Decreasing: $(-\infty, -3)$

6) Increasing: $(-4, \infty)$ Decreasing: $(-\infty, -4)$

7) Increasing: $(-\infty, 0)$ Decreasing: $(0, \infty)$

8) $(-\infty, -1), (-1, 2), (2, \infty)$

9) $(-\infty, \infty)$