

Name \_\_\_\_\_

**Topic 5.6 - Determining Concavity of Functions**

**Topic 5.7 - Using the Second Derivative Test**

Determine the open intervals where the graph of the function is concave up or concave down. Identify any points of inflection. Use a number line to organize your analysis.

1.)  $f(x) = x^4 - 6x^2 + 2x + 3$

2.)  $f(x) = \frac{x^2 - 1}{x}$

3.)  $f(x) = \sin x - \cos x$  on  $(0, 2\pi)$ .

4.)  $f(x) = x^{4/3} + 4x^{1/3}$

Find all critical numbers and use the Second Derivative Test to classify each as the location of a relative maximum, relative minimum or neither.

5.)  $f(x) = x^4 + 4x^2 + 1$

6.)  $f(x) = \frac{x}{\ln x}$

7.)  $f(x) = x^{1/5}(x+1)$

8.)  $f(x) = \frac{\sqrt{x}}{1+\sqrt{x}}$