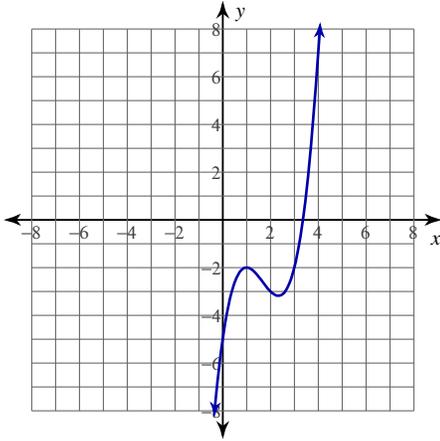


Assignment

Date _____ Period _____

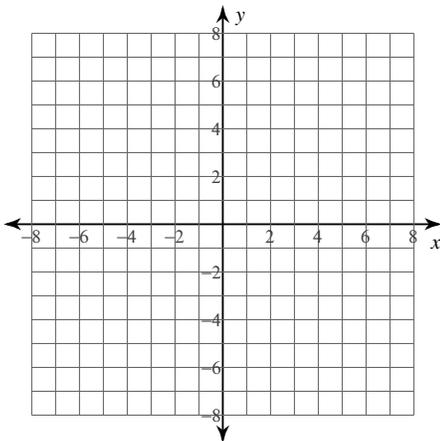
For each problem, find all points of relative minima and maxima.

1) $y = x^3 - 5x^2 + 7x - 5$



For each problem, find all points of relative minima and maxima. You may use the provided graph to sketch the function.

2) $y = x^3 - 6x^2 + 9x + 1$



For each problem, find all points of relative minima and maxima.

3) $y = -x^3 - 3x^2 - 1$

4) $y = x^4 - 2x^2 + 3$

5) $y = x^4 - x^2$

6) $y = -\frac{2}{x^2 - 4}$

7) $y = (2x - 8)^{\frac{2}{3}}$

8) $y = -\frac{1}{5}(x - 4)^{\frac{5}{3}} - 2(x - 4)^{\frac{2}{3}}$

Critical thinking questions:

9) Give an example function $f(x)$ where $f''(0) = 0$ and there is no relative minimum or maximum at $x = 0$.

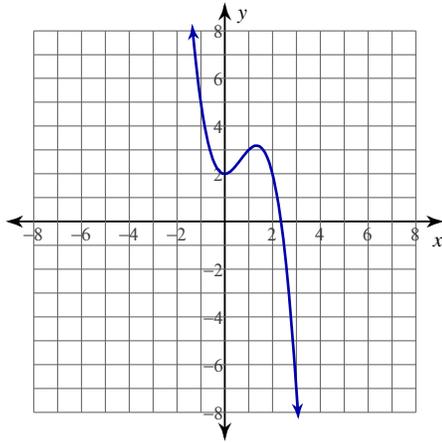
10) Give an example function $f(x)$ where $f''(0) = 0$ and there is a relative maximum at $x = 0$.

Intervals of Increase and Decrease

Date _____ Period _____

For each problem, find the x-coordinates of all critical points, find all discontinuities, and find the open intervals where the function is increasing and decreasing.

1) $y = -x^3 + 2x^2 + 2$



2) $y = x^3 - 11x^2 + 39x - 47$

3) $y = -x^4 + 3x^2 - 3$

4) $y = \frac{x^2}{4x + 4}$

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

$$6) y = (2x - 8)^{\frac{2}{3}}$$

$$7) y = -\frac{1}{5}(x - 4)^{\frac{5}{3}} - 2(x - 4)^{\frac{2}{3}} - 1$$

Critical thinking question:

8) If functions f and g are increasing on an interval, show that $f + g$ is increasing on the same interval.

9) Give an example where functions f and g are increasing on the interval $(-\infty, \infty)$, but where $f - g$ is decreasing.