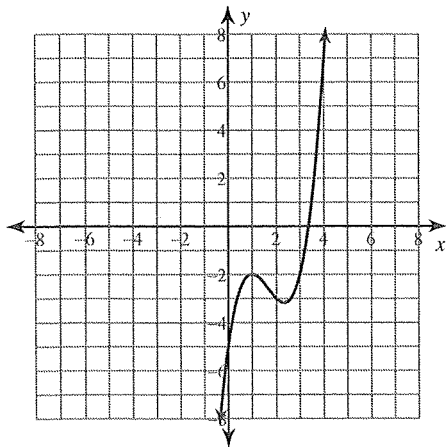


## Assignment

Date \_\_\_\_\_ Period \_\_\_\_\_

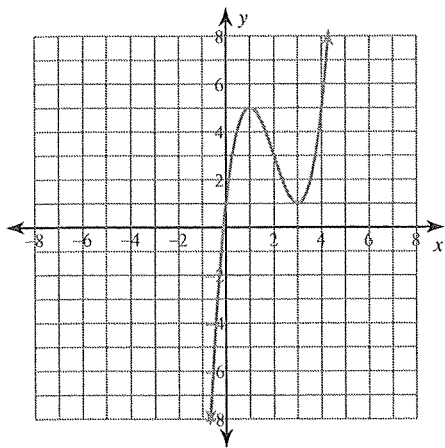
For each problem, find all points of relative minima and maxima.

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

Relative minimum:  $\left(\frac{7}{3}, -\frac{86}{27}\right)$ Relative maximum:  $(1, -2)$ 

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

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

Relative minimum:  $(3, 1)$ Relative maximum:  $(1, 5)$

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

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

Relative minimum:  $(-2, -5)$

Relative maximum:  $(0, -1)$

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

Relative minima:  $(-1, 2), (1, 2)$

Relative maximum:  $(0, 3)$

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

Relative minima:  $\left(-\frac{\sqrt{2}}{2}, -\frac{1}{4}\right), \left(\frac{\sqrt{2}}{2}, -\frac{1}{4}\right)$

Relative maximum:  $(0, 0)$

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

Relative minimum:  $\left(0, \frac{1}{2}\right)$

No relative maxima.

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

Relative minimum:  $(4, 0)$

No relative maxima.

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

Relative minimum:  $\left(0, -\frac{12\sqrt[3]{2}}{5}\right)$

Relative maximum:  $(4, 0)$

**Critical thinking questions:**

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

Many answers. Ex:  $f(x) = 0, x, x^3$ , etc

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

Many answers. Ex:  $f(x) = -x^4$