Name:

Collaborators:

Section Day/Time:

## Extrema, Rolle's Theorem, M.V.T.

**1.** Find the absolute and local maximum and minimum values of $f(x) = 10 - x$ for $x \geq 10$. If an absolute or local extremum does not exist, say so and explain why.

**19.** Find the absolute maximum and minimum values of $f(t) = 7t\sqrt{4 - t^2}$ on the interval $[-1, 2]$.

**28.** Find the absolute and local maximum and minimum values of $f(\theta) = 7\sin(\theta)$, $-2\pi \leq \theta \leq 2\pi$.

## Group Work

**1.**  Identify all of the relative extrema and absolute extrema of the function $f(x)$ graphed below. What is $f'$ at each relative extremum?
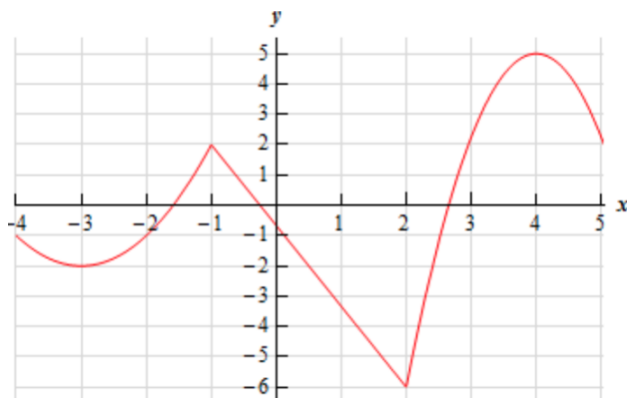


**2.**  Determine the absolute extrema of $f(x) = -2x^5 + 5x^4 + 80x^3 + 1$ on the interval $[0, 7]$.

**3.** For $f(x) = -x^4 - 8x^3 + 5$, answer the following questions:

(a) Determine the intervals on which the function is concave up and concave down.

(b) Determine the inflection points of the function.

(c) Identify the critical points of the function.

(d) Classify the critical points as relative maximums, relative minimums or neither using the Second Derivative Test.

(e) Determine the intervals on which the function increases and decreases.

(f) Use the information from steps (a) – (e) to sketch the graph of the function. (Use the back of this sheet as needed.)