

Extrema quiz review

- a) the intervals on which the function is increasing
- b) the intervals on which the function is decreasing
- c) the intervals on which the function is concave up
- d) the intervals on which the function is concave down
- e) any maximum values
- f) any minimum values
- g) any points of inflection
- h) sketch the graph

1) $f(x) = x^3 - 5x^2 - 8x + 4$

2) $f(x) = 12x^{\frac{1}{3}} - x$

3) $f(x) = \frac{x+2}{x-9}$

Find any absolute extrema for the given function on the given domain:

4) $f(x) = x^2 - 12x + 4 \quad [-3, 5]$

Find the number guaranteed by the mean value theorem or state that MVT is not applicable.

5) $f(x) = x^2 - 3x + 2 \quad [0, 5]$

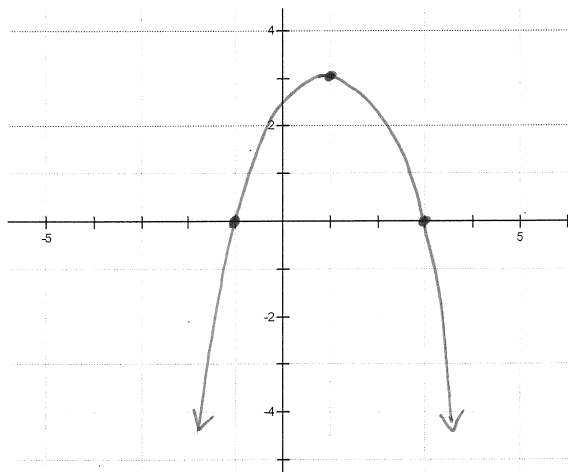
6) $f(x) = x^{\frac{2}{3}} - 4 \quad [-1, 8]$

For each of the following, find:

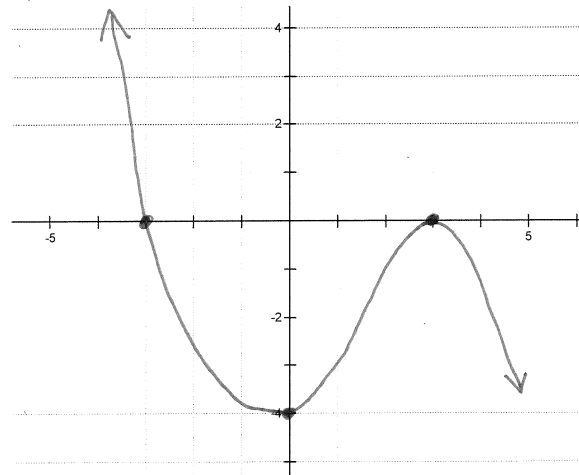
- a) intervals where $f(x)$ is increasing/decreasing
- c) Where any local max or min on $f(x)$ occur

- b) intervals where $f(x)$ is concave up/down
- d) Where any points of inflection on $f(x)$ occur

7)



8)



9)

$$f(-4) = 6, \quad f(5) = 2$$

$$f'(-4) = 0$$

$$f'(x) > 0 \text{ for } (-\infty, -4] \cup (2, \infty)$$

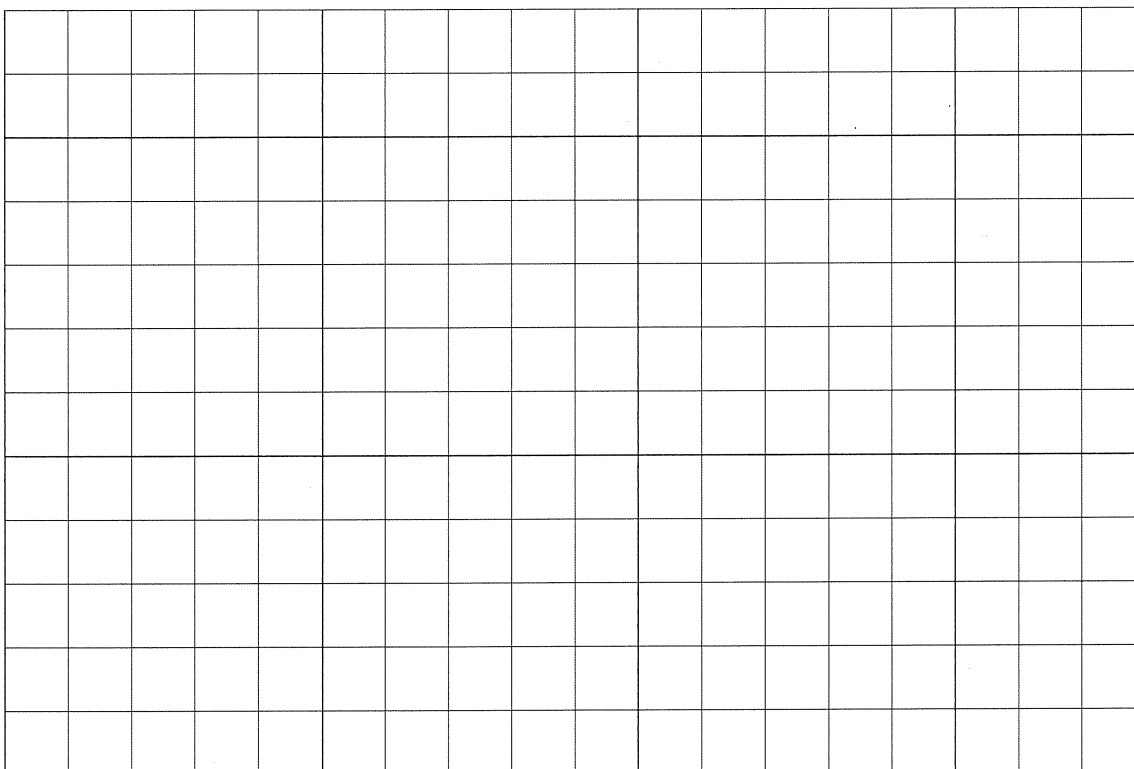
$$f'(x) < 0 \text{ for } [-4, 2)$$

$$f''(-7) = f''(-2) = 0$$

$$f''(x) > 0 \text{ for } (-\infty, -7) \cup (-2, 0)$$

$$f''(x) < 0 \text{ for } (-7, -2) \cup (0, 2) \cup (2, \infty)$$

$$\lim_{x \rightarrow -\infty} f(x) = 1, \quad \lim_{x \rightarrow \infty} f(x) = 3, \quad \lim_{x \rightarrow 2^+} f(x) = -\infty, \quad \lim_{x \rightarrow 2^-} f(x) = -\infty$$



State the extrema values and their type.