

Exam 2

Name:

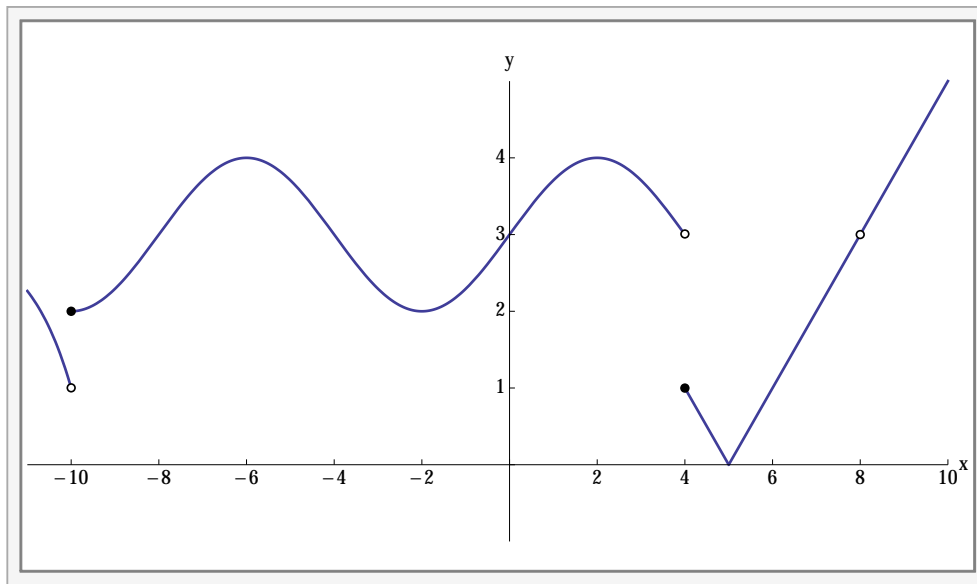
Date: June 11, 2015

P 1. [2 Points] State the Extreme Value Theorem.

P 2. [2 Points] State the Rolle's Theorem.

P 3. [2 Points] State the Mean Value Theorem.

P 4. [8 Points] Consider the graph of f below.



Use the graph of f to answer the following.

(a) $\lim_{x \rightarrow 4^-} f(x)$

(d) Find the critical numbers of $f(x)$ on $[0, 10]$.

(b) $f'(-2)$

(e) Find the extrema on $[-6, -4]$, if any.

(c) $f'(6)$

(f) Find the global maximum and global minimum on $(4, 6)$, if any.

P 5 (10 Points). Find the absolute extrema of $y = x^2 - 8 \ln x$ on $[1, 5]$.

P 6 (10 Points). Find the absolute extrema of $f(x) = x^3 - \frac{3}{2}x^2$ on $[-1, 2]$.

P 7 (10 Points). Find the open intervals on which

$$f(x) = \frac{1}{2}x - \sin x, \quad 0 < x < 2\pi$$

is increasing or decreasing.

P 8 (10 Points). Find the open intervals on which

$$f(x) = x^3 - 6x^2 + 15$$

is increasing or decreasing.

P 9 (10 points). Determine the open intervals on which the graph of

$$f(x) = x^5 - 5x + 2$$

is concave upward or concave downward.

P 10 (10 points). Find the points of inflection of the graph of

$$f(x) = -\frac{x^4}{3} + 18x^2 + 4x + 3$$

P 11 (3 points). Find the horizontal asymptotes, if any, of

$$f(x) = \frac{x^2 - 1}{3x^2 + 4}$$

P 12 (3 points). Find the vertical asymptotes, if any, of

$$f(x) = \frac{x - 1}{x^3 - x^2 - 4x + 4}$$

P 13 (10 Points). Sketch a graph of

$$f(x) = -x^4 + 4x^2$$

Label any intercepts, relative extrema, points of inflection, and asymptotes.

P 14 (10 Points). Sketch a graph of

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

Label any intercepts, relative extrema, points of inflection, and asymptotes.