Calculus Web Assignments

Web Assignments are intended to be completed with a partner. Both partners should individually work each of the problems, followed by a collaborative discussion about the problem.

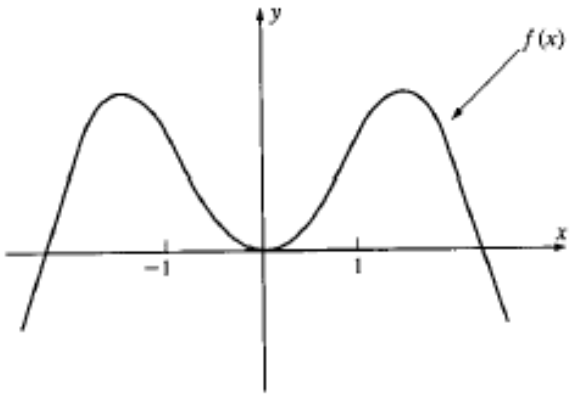
Both partners are required to participate in the "Honor-System" Grading of the Web Assignment.

Calculus: Web Assignment #7

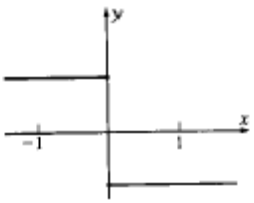
Multiple Choice

Identify the choice that best completes the statement or answers the question.

____ 1. The graph of $f(x)$ is shown in the figure below. Which of the following could be the graph of $f''(x)$?



a.



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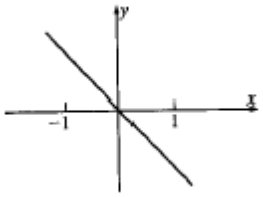
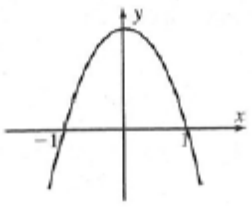
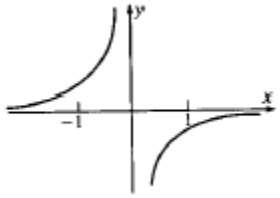


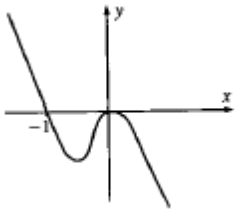
c.



d.



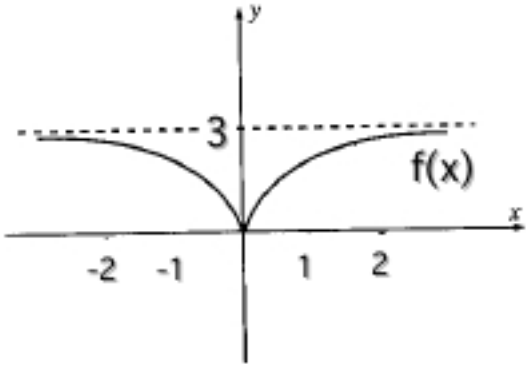
e.



____ 2. To apply either the MeanValue Theorem or Rolle's Theorem to a function *f*, certain requirements regarding the continuity and differentiability of the function must be met. Which of the following states the requirements correctly?

a. f is continuous on (a, b) and differentiable on (a, b)
b. f is continuous on (a, b) and differentiable on [a, b]
c. f is continuous on (a, b) and differentiable on [a, b)
d. f is continuous on [a, b] and differentiable on (a, b)
e. f is continuous on [a, b] and differentiable on [a, b]

____ 3.



Based on the graph show above, which of the following is NOT true?

a. *f* is continuous at $x = 0$
b. $\lim_{x \to 0} f(x) = 0$
c. $\lim_{x \to \infty} f(x) = 3$
d. $f'(x) < 0$ for $x < 0$
e. *f* is differentiable at $x = 0$.

____ 4. Let f be a continuous function on [-4, 12]. If f(-4) = -2 and f(12) = 6, then the mean value theorem guarantees that

a. $f(4) = 2$
b. $f'(4) = \frac{1}{2}$
c. $f'(c) = \frac{1}{2}$ for at least one c between -4 and 12
d. $f(c) = 0$ for at least one c between -4 and 12
e. $f(4) = 0$

____ 5. Let f be a differentiable function over [0, 10] such that $f(0) = 0$ and $f(10) = 3$. If there are exactly two solutions to $f(x) = 4$ over (0, 10) then which of these statements must be true?

a. $f'(c) = 0$ for some c on (0, 10)
b. f has a local maximum at x = 5
c. $f''(c) = 0$ for some c on (0, 10)
d. 0 is the absolute minimum of f
e. f is strictly monotonic

____ 6. Suppose a particle moves on a straight line with a position function s such that its position at any time t is given by $s(t) = 3t^3 - 11t^2 + 8t$. In what interval of time is the particle moving to the left?

a. $\left(-\infty, 0\right)$
b. (0, 1)
c. $\left(1, \frac{8}{3}\right)$
d. $\left(\frac{4}{9}, 2\right)$
e. $\left(2, \infty\right)$

____ 7. A particle moves along a line so that its position at any time $t \geq 0$ is given by $s(t) = 2 + 7t - t^2$.

When is the particle at rest?

a. t = 1
b. t = 2
c. t = 7/2
d. t = 4
e. t = 5

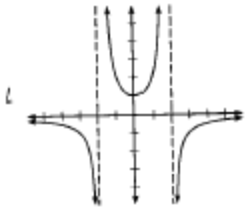
____ 8. Consider the function $f(x) = \frac{(x-a)(x-b)}{(x-c)^2}$. The equations of the asymptotes are

a. $x = a, x = b, x = c$
b. $x = a, x = b$
c. $x = a, y = ab$
d. $x = c, y = 1$
e. $x = c$ only

____ 9. The Mean Value Theorem guarantees the existence of a special point on the graph of $y = \sqrt{x}$ between (1, 1) and (9, 3). What are the coordinates of this point?

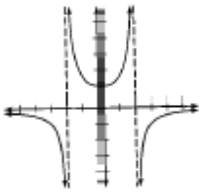
a. (1, 1)
b. $\left(2, \sqrt{2}\right)$
c. $\left(3, \sqrt{3}\right)$
d. (4, 2)
e. none of the above

____ 10. The graph of the function *f* is given below.

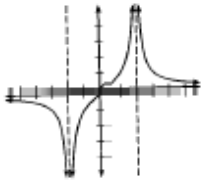


Which of these graphs could be the derivative of *f*?

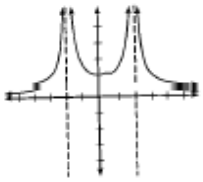
a.



b.



c.



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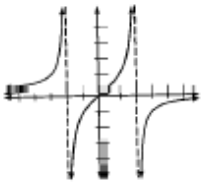

e.