

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 #8

Multiple Choice

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

_____ 1. If $\lim_{x \rightarrow 3} f(x) = 7$, which of the following must be true?

- I. f is continuous at $x = 3$
- II. f is differentiable at $x = 3$
- III. $f(3) = 7$

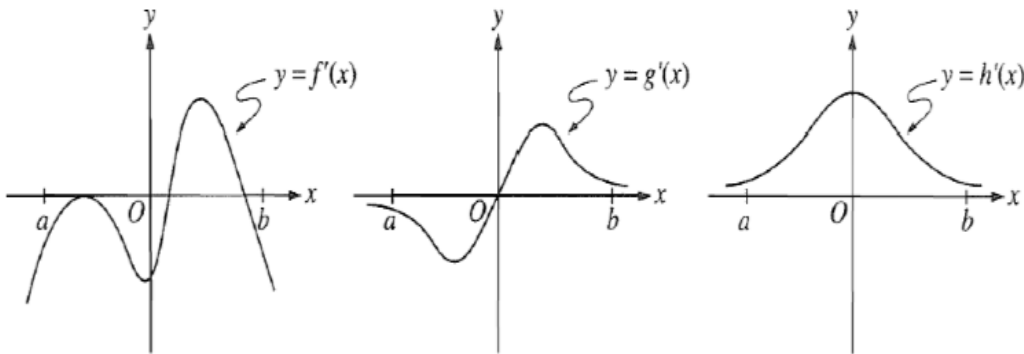
- a. None
- b. II only
- c. III only
- d. I and III only
- e. I, II, and III

_____ 2. Let f be a function that is differentiable on the open interval $(1, 10)$. If $f(2) = -5$, $f(5) = 5$, and $f(9) = -5$, which of the following must be true?

- I. f has at least 2 zeros.
- II. The graph of f has at least one horizontal tangent.
- III. For some c , $2 < c < 5$, $f(c) = 3$.

- a. None
- b. I only
- c. I and II only
- d. I and III only
- e. I, II, and III

- _____ 3. The graphs of the derivatives of the functions f , g , and h are shown above. Which of the functions f , g , or h have a relative maximum on the open interval $a < x < b$?



- a. f only
 b. g only
 c. h only
 d. f and g only
 e. f , g , and h
- _____ 4. The maximum acceleration attained on the interval $0 \leq t \leq 3$ by the particle whose velocity is given by $v(t) = t^3 - 3t^2 + 12t + 4$ is
- a. 9
 b. 12
 c. 14
 d. 21
 e. 40
- _____ 5. An equation of the line tangent to the graph of $y = x + \cos x$ at $x = 0$ is
- a. $y = 2x + 1$
 b. $y = x + 1$
 c. $y = x$
 d. $y = x - 1$
 e. $y = 0$

_____ 6. The radius of a sphere is increasing at a rate of 2 inches per minute. At what rate (in cubic inches per minute) is the volume increasing when the surface area of the sphere is 9π square inches?

- a. 2
- b. 2π
- c. 9π
- d. 18
- e. 18π

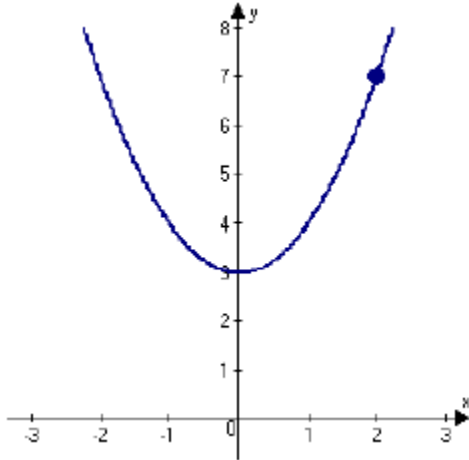
_____ 7. What is the average rate of change of $f(x) = x^3 - 3x^2 + x - 1$ over $[-1, 4]$

- a. $\frac{13}{5}$
- b. 3
- c. 5
- d. 10
- e. 25

_____ 8. The normal line to the curve $y = \sqrt{8 - x^2}$ at the point $(2, 2)$ has slope

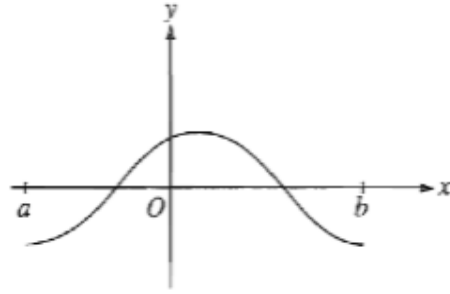
- a. -2
- b. $-\frac{1}{2}$
- c. $\frac{1}{2}$
- d. 1
- e. 2

_____ 9. Determine the limit using the graph. $\lim_{x \rightarrow 2} (x^2 + 3)$

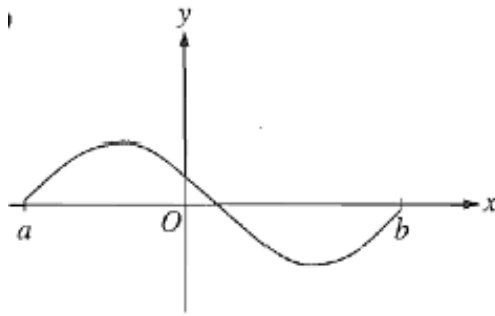


- a. 7
- b. 2
- c. 3
- d. 0
- e. Does not exist

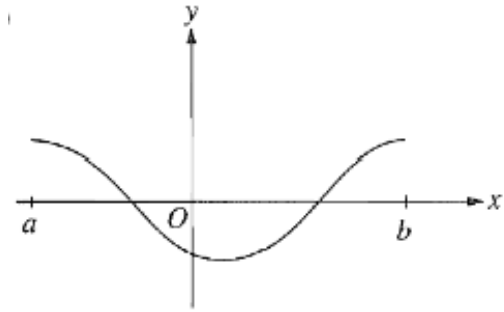
_____ 10. The graph of f is shown in the figure below. Which of the following could be the graph of the derivative of f ?



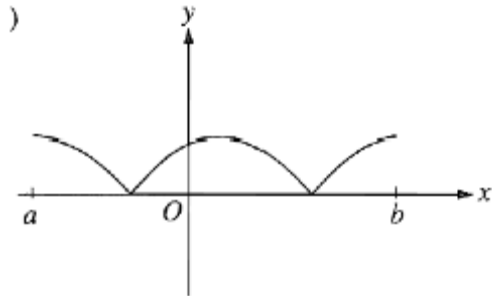
a.



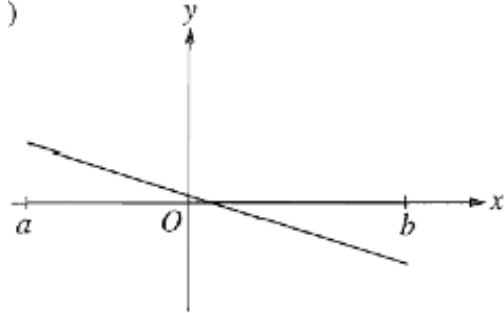
d.



b.



e.



c.

