
QUESTION 1

(1 pts)

We use the Intermediate Value Theorem to:

- A. To show that a function is continuous.
- B. To show that for a continuous function $f(x)$, a solution to $f(x) = 0$ exists.
- C. To show that a function is discontinuous.
- D. To show that $\lim_{x \rightarrow a} f(x)$ does not exist.

QUESTION 2

(1 pts)

What do we need to check in order to use the Intermediate Value Theorem?

- A. Our function $f(x)$ is continuous on the closed interval $[a, b]$.
- B. $f(a) \neq f(b)$.
- C. $f(a) \leq N \leq f(b)$, where N is some number.
- D. All of the above.

QUESTION 3

(1 pts)

The derivative of a function f is:

- A. $f'(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$
- B. The value a , when $f(a) = 0$.
- C. When the limit of a function does not exist.
- D. The value at which a function is discontinuous.

QUESTION 4

(1 pts)

What is one interpretation of the average rate of change?

- A. Instantaneous velocity.
- B. $f'(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$
- C. The average change in position with respect to time.
- D. The derivative of a function f .

QUESTION 5

(1 pts)

What is the instantaneous rate of change?

- A. The derivative of a function f .
- B. Acceleration.
- C. The point at which a function is discontinuous.
- D. When a function $f(x) = 0$.

QUESTION 6

(1 pts)

The derivative of a function f is equal to 0 when:

- A. The graph of the function crosses the x -axis.
- B. When the slope of the tangent line is 0.
- C. At the point $x = 0$.
- D. The derivative does not exist.

QUESTION 7

(1 pts)

What does $\frac{dy}{dx}|_{x=a} = f'(a)$ mean?

- A. The average rate of change is equal to $f'(a)$.
- B. The derivative of y divided by the derivative of x is equal to $f'(a)$.
- C. $f(x) = f'(a)$ when $x = a$.
- D. The derivative of a function f at the point $x = a$ is equal to $f'(a)$.

QUESTION 8

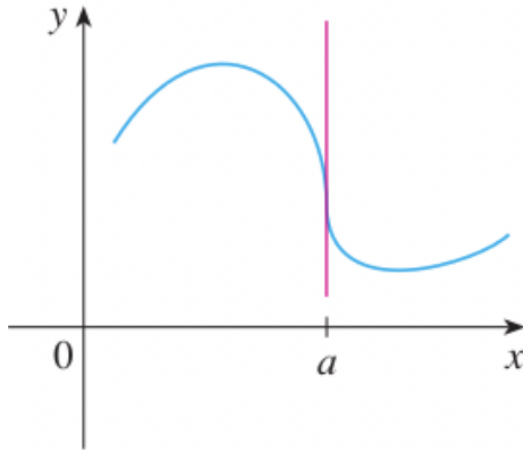
(1 pts)

Suppose we have a function f that represents the position of a particle. The acceleration of the particle can be represented by:

- A. The velocity.
- B. $f'(x)$.
- C. The second derivative of the function.
- D. The instantaneous rate of change.

QUESTION 9

(1 pts)



Is the function, represented by the graph above, differentiable? Why?

- A. No, since the slope of the tangent line is equal to $\pm\infty$.
- B. Yes, since $\lim_{x \rightarrow a^-} f(x) = \lim_{x \rightarrow a^+} f(x)$.
- C. Yes, since there is no jump discontinuity.
- D. No, since $\lim_{x \rightarrow a} f(x) = 0$

QUESTION 10

(1 pts)

Suppose we have the function $f(x) = x^3 - x^2$.

Using the power and difference rules for derivatives, what is $f'(x)$?

- A. $3x^3 - 2x^2$
- B. $3x^2 - 2x$
- C. $3x - 2x$
- D. $3x^4 - 2x^3$