
QUESTION 1

(1 pts)

When do we use the chain rule?

- A. When we don't feel like using the quotient rule.
- B. When we don't feel like using the definition of the derivative.
- C. When we have the composition of two functions $h = f \circ g$, defined by $h(x) = f(g(x))$, where g is differentiable at x and f is differentiable at $g(x)$.
- D. When we have $h(x) = \frac{f(g(x))}{g(x)^2}$ and f and g are both differentiable functions.

QUESTION 2

(1 pts)

Suppose we have the function $h(x) = f(g(x))$. What is $h'(x)$ equivalent to?

- A. $\frac{f'(g(x))}{(g(x)')^2}$
- B. $f'(g(x))g'(x)$
- C. $g'(f(x))f'(x)$
- D. $f(g(x)')f'(x)$

QUESTION 3

(1 pts)

$h(x) = \frac{1}{\sqrt{x^3-x+1}}$. What is $h'(x)$?

- A. $-\frac{3x^2-1}{2(x^3-x+1)^{-3/2}}$
- B. $\frac{2(x^3-x+1)^{3/2}}{3x^2-1}$
- C. $-\frac{3x^2-1}{2(x^3-x+1)^{3/2}}$
- D. $\frac{2(x^3-x+1)^{-3/2}}{3x^2-1}$

QUESTION 4

(1 pts)

$h(x) = \sin^{n-1}(x)$, find $h'(x)$.

- A. $(n-1)\sin^n(x)\cos(x)$
- B. $(n-1)\sin(x)$
- C. $-(n-1)\cos^n(x)\sin(x)$
- D. $(n-1)\sin^{n-2}(x)\cos(x)$

QUESTION 5

(1 pts)

Determine if the functions below are implicit or explicit functions. (Write your answers as A-Explicit, etc.)

- A. $\cos\left(\frac{x}{y}\right) = x + y$
- B. $y = x \sin(x)$
- C. $y = x^3 + 2$
- D. $x^2 + 4y^2 = 4$

QUESTION 6

(1 pts)

$\sqrt{x} + \sqrt{y} = 1$. Find y' .

A. $y' = \frac{1}{2\sqrt{x}}$

C. $y' = 2\sqrt{y} - \frac{\sqrt{yx}}{x}$

B. $y' = -\frac{\sqrt{y}}{\sqrt{x}}$

D. $y' = \frac{1}{2\sqrt{x}} + y$

QUESTION 7

(1 pts)

$2y^2 + x^3 = 2$. Find y' .

A. $y' = -\frac{3x^2}{4y}$

C. $y' = \frac{3y^2}{4y}$

B. $y' = 2 - \frac{3x^2}{4y}$

D. $y' = 4y^2 + 3x^2$

QUESTION 8

(1 pts)

What is the average rate of change of y with respect to x ?

A. $\frac{dy}{dx} = \lim_{\Delta x \rightarrow 0} \frac{\Delta y}{\Delta x}$

C. $\Delta y = f(x_2) - f(x_1)$

B. $\frac{f(x_1) - f(x_2)}{y}$

D. $\frac{f(x_2) - f(x_1)}{x_2 - x_1}$

QUESTION 9

(1 pts)

What is the instantaneous rate of change of y with respect to x ?

A. $\frac{f(x_2) - f(x_1)}{x_2 - x_1}$

C. $\frac{dy}{dx} = \lim_{\Delta x \rightarrow 0} \frac{\Delta y}{\Delta x}$

B. $\Delta x = x_2 - x_1$

D. $\Delta y = f(x_2) - f(x_1)$

QUESTION 10

(1 pts)

The position of a particle is given by the equation $s = f(t) = t^2 + 3t - 1$, where t is measured in seconds and s in meters. What is the velocity at $t = 1$?

A. 5 m/s

C. 4 m/s

B. $2t + 3$

D. 6 m/s