QUIZ 3

Due Jun 8 at 12:30pm **Points** 40 **Questions** 20
Available Jun 8 at 11am - Jun 8 at 12:30pm about 2 hours **Time Limit** 90 Minutes

Instructions

MULTIPLE CHOICE. Choose the best answer.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	50 minutes	40 out of 40

ⓘ Correct answers will be available Jun 15 at 12am - Jun 16 at 12am.

Score for this quiz: **40** out of 40
Submitted Jun 8 at 11:56am
This attempt took 50 minutes.

Question 1 — 2 / 2 pts

What is the slope of the normal line to the curve $y = 2x^3$ at the point $(2, 16)$?

- 6
- -1/24
- -1/6
- 24

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Question 2

Which of the following is the second deri
$y = \cos(2x + 3)$?

- $-\cos(2x + 3)$
- $-\cos(2)$
- $\cos 0$
- **$-4\cos(2x + 3)$**

Question 3

2 / 2 pts

The derivative of $y = \dfrac{x}{x - 1}$ is _____?

- 1
- $\dfrac{1}{(x-1)^2}$
- **$\dfrac{-1}{(x-1)^2}$**
- $\dfrac{2x-1}{(x-1)^2}$

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Question 4

If $f(x) = (4x^3 + 2x - 1)^4$, then $f'(x$ _____?

- $48x(12x^2 + 2)^3$
- $4(4x^3 + 2x - 1)^3$
- $8\left(6x^2 + 1\right)\left(4x^3 + 2x - 1\right)^3$
- $4(12x^2 + 2)^3$

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Question 5

2 / 2 pts

Suppose $f(x) = \tan(x^2) + \cot^2 x$. What is $f'(x)$?

- $\sec^2(x^2) - 2\cot x$
- $\sec^2(2x) - 2\csc x \cot x$
- $2x\sec^2(x^2) - 2\csc^2 x \cot x$
- $\sec^2(x^2) - 2\csc x \cot x$

Question 6

2 / 2 pts

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Let $A(x) = 3x^2$. The instantaneous ra
unit change in x at $x = -2$ is equal to

- 3
- -12
- 12
- -3

Question 7

$\frac{d}{dx}(\sec^2 x - \tan^2 x)$= _____?

- 0
- $4 \sec x \tan x$
- $2 \sec x - 2 \tan x$
- $2 \sec x + 2 \tan x$

Question 8

2 / 2 pts

Given $x^2 - 3xy^3 = 10$. Find $\frac{dy}{dx}$.

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- $\frac{2x}{9y^2}$
- $-\frac{2x}{9y^2}$
- $\frac{3y^2-2x}{9xy^2}$
- **$\frac{2x-3y^2}{9xy^2}$**

Question 9

Given the function defined by:

$$f(x) = \begin{cases} 2x, & \text{if } x \\ x^2, & \text{if } x \leq 2 \end{cases}$$

What is $f'_+(2)$?

- 4
- DNE
- 2
- $+\infty$

Question 10

2 / 2 pts

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Given the function defined by:

$$f(x) = \begin{cases} 2x, & \text{if } x > 2 \\ x^2, & \text{if } x \leq 2 \end{cases}$$

Does $f'(2)$ exists? Why?

- Yes; $f'_+(2) = f'_-(2)$
- No; $\lim_{x \to 2^+} f(x) \neq \lim_{x \to 2^-} f(x)$
- **No; $f'_+(2) \neq f'_-(2)$**
- Yes; f is continuous at $x = 2$.

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Question 11

2 / 2 pts

Let $f(x) = \cos^2(4x^3)$, then $f'(x)$ is

- $-24x^2 \cos(4x^3)$
- **$-24x^2 \cos(4x^3) \sin(4x^3)$**
- $-2\cos(4x^3)\sin(4x^3)$
- $-12x^2 \sin^2(4x^3)$

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Question 12

Given $f(x) = \sin\left(\frac{x-1}{x+2}\right)$. Then, $f'(x)$ is

- $\cos\left(\frac{x-1}{x+2}\right)$
- $\cos\left(\frac{3(x-1)}{(x+2)^3}\right)$
- $\cos\left(\frac{3}{(x+2)^2}\right)$
- $\frac{3}{(x+2)^2}\cos\left(\frac{x-1}{x+2}\right)$

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Question 13

2 / 2 pts

Which of the following statements is NOT ALWAYS TRUE?

- If *f* is differentiable at $x = a$, then *f* is continuous at $x = a$.
- If $f'_+(a) = f'_-(a) = k$, then $f'(a) = k$.
- If $f'_+(a) \neq f'_-(a)$, then $f'(a)$ do not exists.
- If *f* is continuous at $x = a$, then then *f* is differentiable at $x = a$.

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Question 14

The derivative of $f(x) = \frac{x^2}{6} + \frac{6}{\sqrt{x}}$ is

- $\frac{x}{12} - \frac{3}{\sqrt[3]{x^2}}$
- $\frac{x}{3} - \frac{3}{\sqrt[3]{x^2}}$
- $\frac{x}{12} - \frac{3}{\sqrt{x^3}}$
- **$\frac{x}{3} - \frac{3}{\sqrt{x^3}}$**

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Question 15

2 / 2 pts

The 4th derivative of $y = \frac{2}{x}$ is?

- $-\frac{2}{x^2}$
- $\frac{4}{x^3}$
- **$\frac{48}{x^5}$**

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$\frac{12}{x^4}$

Question 16

Let

$$f(x) = \begin{cases} x^2 & x \leq 1 \\ 2x & x > 1 \end{cases}$$

Which of the following statements is FAL

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$f'(1)$ do not exists because $f(x)$ is NOT continuous at $x = 1$

$f'(1) = 2$

$f'_{-}(1) = 2$

$f'_{+}(1) = 2$

Question 17

2 / 2 pts

Given that:

$$\cos(x+y) - \sin(x+y) = 2.$$

Then $\frac{dy}{dx}$ is equal to ?

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- 1
- undefined
- -1
- 0

Question 18

Suppose that the tumor in a person's bo
shape. The average rate of change of th
with respect to the radius, as the radius
1.0 cm is?

Recall that the volume of the sphere is given by $V(r) = \frac{4}{3}\pi r^3$, where r is the radius

- $\frac{19}{12}\pi$
- π
- $\frac{7}{3}\pi$
- 4π

Question 19

2 / 2 pts

Suppose that the tumor in a person's body is spherical in
shape. The instantaneous rate of chang

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tumor with respect to the radius, when t

Recall that the volume of the sphere is g
$V(r) = \frac{4}{3}\pi r^3$, where r is the radius

- $\frac{19}{12}\pi$
- **4π**
- π
- $\frac{7}{3}\pi$

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Question 20

Find the equation of the line tangent to the curve $x^2 + 4y^2 = 13$ at the point $(3, -1)$.

- $4x - 3y - 15 = 0$
- **$3x - 4y - 13 = 0$**
- $4x + 3y - 9 = 0$
- $3x + 4y - 5 = 0$

Quiz Score: **40** out of 40

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