

## Quiz Review Report

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**Subject: Calculus**

**Score: 0 / 10**

**Accuracy: 0.00%**

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1. Evaluate the limit:  $\lim_{x \rightarrow 2} (x^2 + 3x - 10) / (x - 2)$

- A) 7
- B) 0
- C) Undefined
- D) 1

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Your Answer:  
A

Correct Answer: 7

Explanation:

Factor the numerator as  $(x-2)(x+5)$ . Cancel  $(x-2)$  and evaluate the limit of  $(x+5)$  as  $x$  approaches 2.

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2. Find the derivative of  $f(x) = \sin(2x) * \cos(x)$

A)  $2\cos(2x)\cos(x) - \sin(2x)\sin(x)$

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$$\cos(2x)\cos(x) - \sin(2x)\sin(x)$$

C)  $2\cos(2x)\cos(x) + \sin(2x)\sin(x)$

D)  $-2\cos(2x)\cos(x) - \sin(2x)\sin(x)$

Your Answer: C

Correct Answer:  $2\cos(2x)\cos(x) - \sin(2x)\sin(x)$

# Explanation:

Use the product rule:  $(uv)' = u'v + uv'$ .  $u = \sin(2x)$ ,  $v = \cos(x)$ .  $u' = 2\cos(2x)$ ,  $v' = -\sin(x)$ .

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3. What is the integral of  $\int x \cdot e^{(x^2)} dx$ ?

- A)  $e^{(x^2)} + C$
- B)  $0.5 \cdot e^{(x^2)} + C$
- C)  $2 \cdot e^{(x^2)} + C$
- D)  $x^2 \cdot e^{(x^2)} + C$

Your Answer: B

Correct Answer:  $0.5 \cdot e^{(x^2)} + C$

Explanation:

Use  $u$ -  
substitution.  
Let  $u = x^2$ ,

then  $du = 2x$   
dx. The  
integral

becomes 0.5

$$\int_0^1 e^u du = 0.5$$

$$e^u + C = 0.5$$

\*  $e^G(x^2) + C.$

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4. Find the critical points of the function  $f(x) = x^3 - 6x^2 + 5$



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A)  $x = 0, x = 4$

4

- B)  $x = 2, x = 3$
- C)  $x = -2, x = -3$
- D)  $x = 1, x = 5$

Your Answer: B

Correct Answer:  $x = 0, x = 4$

Explanation:

Find the derivative  $f'(x) = 3x^2 - 12x$ . Set  $f'(x) = 0$  and solve for  $x$ :  $3x(x-4) = 0$ , so  $x = 0$  or  $x = 4$ .

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5. Determine  
if the series  
" $(n=1 \text{ to } ) 1/$ "

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$n^2$   
converges or  
diverges.

- A) Converges
- B) Diverges

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~~C) Cannot~~  
be determined

D) Oscillates

Your Answer: C

Correct Answer: Converges

Explanation:

This is a p-series with  $p = 2$ . A p-series converges if  $p > 1$  and diverges if  $p \leq 1$ . Since  $2 > 1$ , the series converges.

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6. What is the area between the curve  $y =$

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$x^2$  and the  $x$ -axis from  $x = 0$  to  $x = 2$ ?

- A)  $\frac{8}{3}$
- B) 4

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D)  $16/3$

Your Answer: A

Correct Answer:  $8/3$

Explanation:

Integrate  $x^2$  from 0 to 2:  $\int_0^2 x^2 dx = [x^3/3] \text{ from } 0 \text{ to } 2 = (8/3) - 0 = 8/3$ .

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7. Find the equation of the tangent line to the curve  $y = x^3 - 2x + 1$  at the point (1, 0).

A)  $y = x - 1$

B)  $y = x + 1$

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C)  $y = -x + 1$

D)  $y = -x - 1$

Your Answer: B

Correct Answer:  $y = x - 1$

Explanation:

Find the derivative  $y' = 3x^2 - 2$ . Evaluate  $y'$  at  $x = 1$ :  $y'(1) = 3(1)^2 - 2 = 1$ . The tangent line has slope 1 and passes through  $(1, 0)$ . Using point-slope form:  $y - 0 = 1(x - 1) \Rightarrow y = x - 1$ .

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8. Find the second derivative of  $f(x) = x^4 - 3x^2 + 2x - 5$

A)  $12x^2 - 6$



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B)  $4x^3 - 6x + 2$

C)  $12x^2 - 6x$

D)  $4x^3 - 6$

Your Answer: C

Correct Answer:  $12x^2 - 6$

Explanation:

First derivative:  $f'(x) = 4x^3 - 6x + 2$ . Second derivative:  $f''(x) = 12x^2 - 6$ .

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**9. Evaluate  
the definite  
integral:  $\int_0^1 (x^2 + 1) dx$**

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- A) 0
- B) 1
- C) -1
- D)  $\frac{1}{2}$

Your Answer: B

Correct Answer: 1

Explanation:

The integral of  $\cos(x)$  is  $\sin(x)$ . Evaluate  $\sin(x)$  from 0 to  $\frac{\pi}{2}$ .  $\sin(\frac{\pi}{2}) - \sin(0) = 1 - 0 = 1$ .

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100% QUIZ REVIEW

Q Determine whether the function  $f(x) =$

**$x^6 + \sin(x)$  is  
even, odd, or  
neither.**

- A) Even
- B) Odd

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~~C) Neither~~

D) Both

Your Answer: B

Correct Answer: Odd

Explanation:

A function is even if  $f(-x) = f(x)$  and odd if  $f(-x) = -f(x)$ .  $f(-x) = (-x)^3 + \sin(-x) = -x^3 - \sin(x) = -(x^3 + \sin(x)) = -f(x)$ . Therefore, the function is odd.

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