

Summary in Graph

Exam Summary (GO Classes Test Series 2024 | Calculus | Test 1).

Qs. Attempted:	20 10 + 10	Correct Marks:	26 8 + 18
Correct Attempts:	17 8 + 9	Penalty Marks:	0.67 0.67 + 0
Incorrect Attempts:	3 2 + 1	Resultant Marks:	25.33 7.33 + 18

Total Questions:	20 10 + 10
Total Marks:	30 10 + 20
Exam Duration:	60 Minutes
Time Taken:	47 Minutes

- EXAM RESPONSE
- EXAM STATS
- FEEDBACK

Technical

Q #1

Multiple Choice Type

Award: 1

Penalty: 0.33

Calculus

Evaluate the limit

$$\lim_{x \rightarrow 0} \frac{1 - \cos x}{\sin^2 x}$$

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

- Your Answer: B
- Correct Answer: B
- Correct
- Discuss

Q #2

Multiple Choice Type

Award: 1

Penalty: 0.33

Calculus

Determine the value of following limit

$$\lim_{x \rightarrow \infty} \left( \sqrt{x^2 + 4x + 1} - x \right)$$

- A. 2
- B. 4
- C.  $\frac{1}{2}$
- D. 3

Your Answer: A    Correct Answer: A    Correct    Discuss

Q #3    Multiple Choice Type    Award: 1    Penalty: 0.33    Calculus

The function  $f(x) = x^4 - 6x^2$  is increasing on the intervals

- A.  $(0, \sqrt{3})$  only
- B.  $(\sqrt{3}, \infty)$  only
- C.  $(-\infty, -\sqrt{3})$  and  $(0, \sqrt{3})$  only
- D.  $(-\sqrt{3}, 0)$  and  $(\sqrt{3}, \infty)$  only

Your Answer: D    Correct Answer: D    Correct    Discuss

Q #4    Multiple Choice Type    Award: 1    Penalty: 0.33    Calculus

The function  $f(x) = \cos x - x$

- A. is an even function
- B. is an odd function
- C. is neither an even nor an odd function
- D. None of these

Your Answer: B    Correct Answer: C    Incorrect    Discuss

Q #5    Multiple Choice Type    Award: 1    Penalty: 0.33    Calculus

Which of the following functions satisfy the conditions of Rolle's Theorem on the interval  $[-1, 1]$ ?

$$f(x) = 1 - x^{2/3}$$
$$g(x) = x^3 - 2x^2 - x + 2$$
$$h(x) = \cos\left(\frac{\pi}{4}(x + 1)\right)$$

Rolle's Theorem applies to:

- A. both  $f$  and  $g$
- B. both  $g$  and  $h$
- C.  $g$  only
- D.  $h$  only

Your Answer: B    Correct Answer: C    Incorrect    Discuss

Q #6    Multiple Choice Type    Award: 1    Penalty: 0.33    Calculus

Suppose that the derivative of a function  $h$  is given by:

$$h'(x) = x(x - 1)^2(x - 2)$$

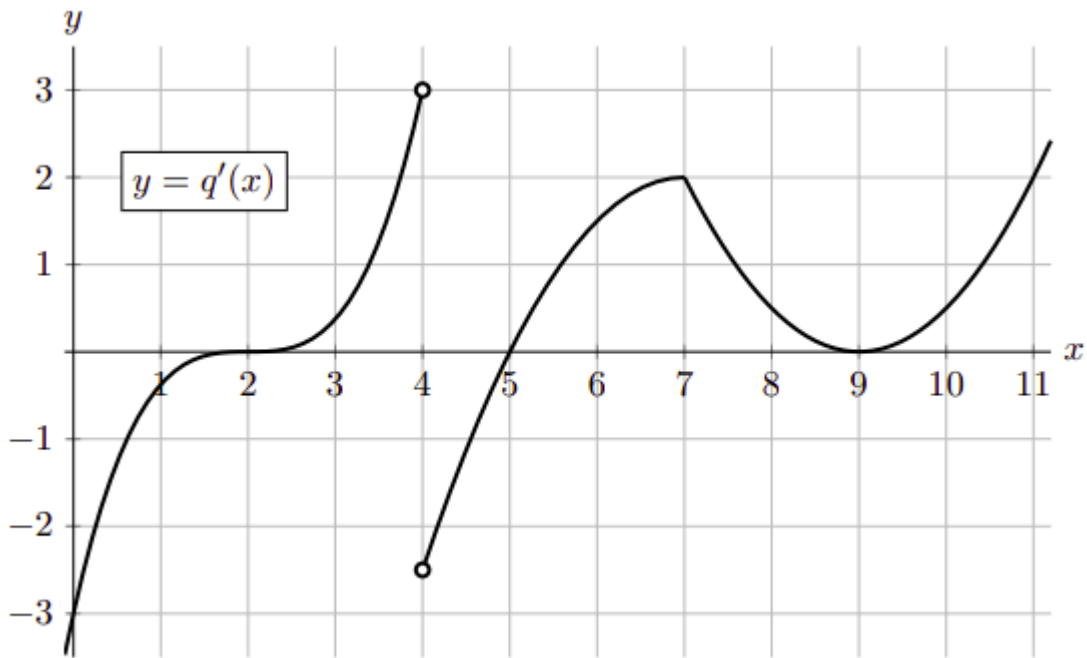
On what interval(s) is  $h$  increasing?

- A.  $(-\infty, 0)$
- B.  $(-\infty, 0)$  and  $(2, \infty)$
- C.  $(0, 2)$
- D.  $(0, 1)$  and  $(2, \infty)$

Your Answer: B    Correct Answer: B    Correct    Discuss

Q #7    Multiple Select Type    Award: 1    Penalty: 0    Calculus

Let  $q(x)$  be a continuous function which is defined for all real numbers. A portion of the graph of  $q'(x)$ , the derivative of  $q(x)$ , is shown below.



On which of the following interval(s) is  $q(x)$  increasing?

- A.  $(0, 2)$
- B.  $(2, 4)$
- C.  $(7, 9)$
- D. None of these

Your Answer: B;C    Correct Answer: B;C    Correct    Discuss

Q #8    Multiple Select Type    Award: 1    Penalty: 0    Calculus

Choose the CORRECT statement -

- A. The function  $f(x) = \exp(-x^2) - 1$  has the root  $x = 0$ .
- B. If a function  $f$  is differentiable on  $[-1, 1]$ , then there is a point  $x$  in that interval where  $f'(x) = 0$ .
- C. If 1 is a root of  $f$ , then  $f'(x)$  changes sign at 1.
- D. If  $f''(0) < 0$  and  $f''(1) > 0$  then there is a point in  $(0, 1)$ , where  $f$  has an inflection point.

Your Answer: A;D    Correct Answer: A;D    Correct    Discuss

Q #9    Multiple Choice Type    Award: 1    Penalty: 0.33    Calculus

Evaluate  $y''(1)$  where  $y = e^x + x^e$ .

- A. 0
- B. 1
- C.  $e^2$
- D.  $e$

Your Answer: C

Correct Answer: C

Correct

Discuss

Q #10

Multiple Choice Type

Award: 1

Penalty: 0.33

Calculus

Consider the following statements:

- I.  $f(x)$  is continuous on  $[a, b]$
- II.  $f(x)$  is differentiable on  $(a, b)$
- III.  $f(a) = f(b)$

Which of the above statements are required in order to guarantee a  $c \in (a, b)$  such that  $f'(c)(b - a) = f(b) - f(a)$ ?

- A. I only
- B. I and II only
- C. I, II, and III
- D. I and III only

Your Answer: B

Correct Answer: B

Correct

Discuss

Q #11

Multiple Select Type

Award: 2

Penalty: 0

Calculus

Let  $I = (a, b)$  be an open interval and let  $f$  be a function which is differentiable on  $I$ . Which of the followings is/are true statements -

- A. If  $f'(x) = 0$  for all  $x \in I$ , then there is a constant  $r$  such that  $f(x) = r$  for all  $x \in I$ .
- B. If  $f'(x) > 0$  for all  $x \in I$ , then  $f(x)$  is strictly increasing on  $I$ .
- C. If  $f'(x) < 0$  for all  $x \in I$ , then  $f(x)$  is strictly decreasing on  $I$ .
- D. If  $f'(x) > 0$  for all  $x \in I$ , then  $f(x)$  is strictly decreasing on  $I$ .

Your Answer: A;B;C

Correct Answer: A;B;C

Correct

Discuss

Q #12

Multiple Select Type

Award: 2

Penalty: 0

Calculus

Which of the following is/are FALSE?

- A. The absolute maximum value of  $f(x) = \frac{1}{x}$  on the interval  $[2, 4]$  is 2.
- B. If  $f(x)$  is a continuous function and  $f(3) = 2$  and  $f(5) = -1$ , then  $f(x)$  has a root between 3 and 5.
- C. The function  $g(x) = 2x^3 - 12x + 5$  has 5 real roots.
- D. If  $h(x)$  is a continuous function and  $h(1) = 4$  and  $h(2) = 5$ , then  $h(x)$  has no roots between 1 and 2.

Your Answer: A;C;D

Correct Answer: A;C;D

Correct

Discuss

Q #13

Multiple Choice Type

Award: 2

Penalty: 0.67

Calculus

Suppose  $g(x)$  is a polynomial function such that  $g(-1) = 4$  and  $g(2) = 7$ . Then there is a number  $c$  between  $-1$  and  $2$  such that

- A.  $g(c) = 1$
- B.  $g'(c) = 1$
- C.  $g(c) = 0$
- D.  $g'(c) = 0$

Your Answer: B

Correct Answer: B

Correct

Discuss

Q #14

Multiple Select Type

Award: 2

Penalty: 0

Calculus

Which of the following limit is/are correct?

- A.  $\lim_{x \rightarrow \infty} \sqrt[x]{x} = 1$
- B.  $\lim_{x \rightarrow \infty} \sqrt[x]{x} = e$
- C.  $\lim_{x \rightarrow \infty} \left(1 + \frac{2}{x}\right)^x = e^2$
- D.  $\lim_{x \rightarrow \infty} \left(1 + \frac{2}{x}\right)^x = e$

Your Answer: C

Correct Answer: A;C

Incorrect

Discuss

Q #15

Multiple Choice Type

Award: 2

Penalty: 0.67

Calculus

Suppose  $f$  is twice differentiable with

$f''(x) = 7x - 2, \quad f'(-2) = 0, \quad \text{and} \quad f(-2) = -2.$

Find  $f(0)$ .

- A.  $-337/6$
- B.  $-74/3$
- C.  $23/9$
- D.  $37/4$

Your Answer: B

Correct Answer: B

Correct

Discuss

Q #16

Multiple Choice Type

Award: 2

Penalty: 0.67

Calculus

The sum of three positive numbers is  $12$  and two of them are equal. Find the largest possible product.

- A.  $86$
- B.  $64$
- C.  $48$
- D.  $72$

Your Answer: B

Correct Answer: B

Correct

Discuss

Q #17

Multiple Choice Type

Award: 2

Penalty: 0.67

Calculus

If  $f(x) = e^x g(x)$ ,  $g(0) = 2$  and  $g'(0) = 1$ , then  $f'(0)$  is

- A. 1
- B. 3
- C. 2
- D. 0

Your Answer: B

Correct Answer: B

Correct

Discuss

Q #18

Multiple Choice Type

Award: 2

Penalty: 0.67

Calculus

Let  $f$  be differentiable for all  $x$ . If  $f(1) = -2$  and  $f'(x) \geq 2$  for  $x \in [1, 6]$ , then

- A.  $f(6) \geq 8$
- B.  $f(6) < 8$
- C.  $f(6) < 5$
- D.  $f(6) = 5$

Your Answer: A

Correct Answer: A

Correct

Discuss

Q #19

Multiple Choice Type

Award: 2

Penalty: 0.67

Calculus

The equation  $x^5 + x + 1 = 0$  has a solution in the interval

- A.  $[0, 1]$
- B.  $[-1, 0]$
- C.  $[-2, -1]$
- D.  $[1, 2]$

Your Answer: B

Correct Answer: B

Correct

Discuss

Q #20

Multiple Choice Type

Award: 2

Penalty: 0.67

Calculus

Which of the following expression evaluates to given integral

$$\int \frac{\ln(\ln x)}{x \ln x} dx$$

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

Your Answer: B

Correct Answer: B

Correct

Discuss

You're doing Great!