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Courses » Basic Calculus for Engineers, Scientists and Economists Announcements Course Ask a Question Progress



# Unit 3 - Week- 02-Continuity, Derivative, Maxima and Minima and Taylor's expansion

## Course outline

How to access the portal

Week 01 - Numbers, Functions, Sequences and Limits of Functions

Week- 02-Continuity, Derivative, Maxima and Minima and Taylor's expansion

- Lecture 07 - Limits And Continuity- 3
- Lecture 08 - Derivative- 1
- Lecture 09 - Derivative- 2
- Lecture 10 - Maxima And Minima
- Lecture 11 - Mean-Value Theorem And Taylor's Expansion-1
- Lecture 12 - Mean - Value Theorem And Taylor's Expansion-2
- Quiz : Assignment-2
- Assignment-2 Solution

Week 03-Integration Of Real Functions

Unit 4 - Week - 04 - Function of Two Variables, Limits, Continuity, Differentiability, Unconstrained and Constrained minimization

Week - 05 - Infinite Series, Multiple Integrals

## Assignment-2

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

Due on 2017-02-07, 23:59 IST.

1) 1 point  
It can be shown that the inequalities  $\frac{1}{2} - \frac{x^2}{24} < \frac{1-\cos x}{x^2} < \frac{1}{2}$  holds for all values of  $x$  close to zero. Then  $\lim_{x \rightarrow 0}$

- 0.
- $\frac{1}{2}$
- $-\frac{1}{2}$ .
- $\sqrt{6}$ .

No, the answer is incorrect.  
Score: 0

Accepted Answers:

$$\frac{1}{2}$$

2) Let  $f(x) = \begin{cases} x, & \text{if } x < 0 \\ x^2, & \text{if } x \geq 0. \end{cases}$ , then 0 points

- $f'_+ = 1$  and  $f'_- = 0$ .
- $f'_+ = 0$  and  $f'_- = 1$ .
- $f'_+ = 1$  and  $f'_- = 1$ .
- $f'_+ = 0$  and  $f'_- = 0$ .

No, the answer is incorrect.  
Score: 0

Accepted Answers:

$$f'_+ = 0 \text{ and } f'_- = 1.$$

3) The derivative of the function  $g(t) = \cot(2 + \operatorname{cosec} t)$  at  $t = \frac{\pi}{4}$  is 1 point

- $\sqrt{2} \operatorname{cosec}^2(2 + \sqrt{2})$ .
- $\operatorname{cosec}^2 \sqrt{2}$ .
- $\operatorname{cosec}^2(\sqrt{2} + 2)$ .
- $\sqrt{2} \operatorname{cosec}^2 \sqrt{2}$ .

No, the answer is incorrect.  
Score: 0

Accepted Answers:

$$\sqrt{2} \operatorname{cosec}^2(2 + \sqrt{2}).$$

4) 1 point

The 10th derivative of the function  $f(x) = x^{11} + x^9 + 7x + 5$  at  $x = \frac{1}{10!}$  is

1.  
 2.  
 11.  
 13.

No, the answer is incorrect.

Score: 0

Accepted Answers:

11.

5) Let  $f(x) = \begin{cases} \sin x, & \text{if } -2\pi \leq x < 0 \\ -x^2, & \text{if } 0 < x \leq 2\pi. \end{cases}$  Then all the local maximizers of  $f$  are

0.  
  $-\pi, 0$ .  
  $-3\pi/2, 0$ .  
  $-3\pi/2$ .

No, the answer is incorrect.

Score: 0

Accepted Answers:

$-3\pi/2$ .

6) For the function  $f(x) = (x - 1)^2(x - 2)^2$ , the local minimizers are

- $x = 0, x = 1$ .  
  $x = -1, x = -2$ .  
  $x = 1, x = 2$ .  
  $x = 0, x = 2$ .

No, the answer is incorrect.

Score: 0

Accepted Answers:

$x = 1, x = 2$ .

7) Let  $f(x) = \cos(x - \pi)$  over the interval  $[-\pi, \pi]$ . Then  $f'(c) = 0$ ,  $c \in [-\pi, \pi]$  for  $c = \dots$

- $\pi$ .  
  $0, \pi$ .  
  $0, \pi, -\pi$ .  
  $-\pi, 0, \pi, 3\pi$ .

No, the answer is incorrect.

Score: 0

Accepted Answers:

$0, \pi, -\pi$ .

8)

The error term in 5th order Taylor polynomial approximation of the function  $f(x) = (x + 2)^4$  is

- $x^4$ .  
  $(x + 2)^4$ .  
 0.



1 point

1 point

1 point

1 point

$$x^4 + 2.$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

0.

9) The 6th order Taylor polynomial of the function  $f(x) = x^2 \cos x$  at  $x = 0$  is given by

1 point



$$x^2 \left( 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} \right).$$



$$x^2 \left( 1 + \frac{x^2}{2!} - \frac{x^4}{4!} + \frac{x^6}{6!} \right).$$



$$1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!}.$$



$$x^2 - \frac{x^4}{2!} + \frac{x^6}{4!}.$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$x^2 - \frac{x^4}{2!} + \frac{x^6}{4!}.$$

10) Let  $y = e^x$  and  $z = \sin 2y^2$ . Then  $\frac{dz}{dx}$  at  $x = 1/2$  is

1 point



$$4e \cos 2e.$$



$$4e^{1/4} \cos 2e^{1/4}.$$



$$e \cos 2e.$$



$$4e^{1/4} \cos 2e^{1/4}.$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$4e \cos 2e.$$





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