Unit 13 - Week 11

Course outline

How does an NPTEL online course work?

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- WEEK 10 & 11 - INTRODUCTION
- 31.1 The exponential function
- 31.2 The inverse function theorem
- 31.3 The Logarithm
- 32.1 Trigonometric functions
- 32.2 The number Pi
- 32.3 The graphs of sin and cos
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Assignment 11

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

Due on 2020-12-02, 23:59 IST.

1) Let $f : (0, \infty) \to \mathbb{R}$ be the function x^x . Then the derivative of f is *1 point*

- x^x
- $x . x^{x-1}$
- $x^x(\log\ x + 1)$
- $x^x \log\ x$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$x^x(\log\ x + 1)$

2) What is $\lim_{x\to\infty} \frac{(\log\ x)^2}{x^2}$? *1 point*

- ∞
- 0
- 1
- The limit neither converges nor diverges to ∞.

No, the answer is incorrect.
Score: 0
Accepted Answers:
0

3) Which one of the following combined can be used to prove that $\lim_{h\to 0} \frac{sin\ h}{h} = 0$ *0 points*

- The derivative of sin is cos
- The derivative of cos is sin
- The fundamental theorem of calculus
- cos 0 = 1

No, the answer is incorrect.
Score: 0
Accepted Answers:
The derivative of sin is cos
cos 0 = 1

4) The function sin restricted to the interval $[-\pi/2, \pi/2]$ is invertible and the inverse is differentiable. What is its derivative? *1 point*

- $\frac{1}{\cos\ x}$
- $\frac{1}{(1-x)^2}$
- $\frac{1}{\sqrt{1-x^2}}$
- $\frac{1}{\sin\ x}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{1}{\sqrt{1-x^2}}$

5) Which of the following ineuqalities are true for $x \geq 0$? *1 point*

- $\sin x \leq x$
- If $0 < x < \frac{\pi}{2}$ then $\sin x < x$
- $\cos x \geq 1 - \frac{x^2}{2}$
- $\sin x \geq x - \frac{x^3}{3!}$.

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\sin x \leq x$
If $0 < x < \frac{\pi}{2}$ *then* $\sin x < x$
$\cos x \geq 1 - \frac{x^2}{2}$
$\sin x \geq x - \frac{x^3}{3!}$.