

Increasing and Decreasing Functions

SUBJECT : MATHEMATICS

CHAPTER NUMBER:6

CHAPTER NAME : Application of Derivatives

CHANGING YOUR TOMORROW

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Proving the monotonicity of a function on a given interval

Problem- 1

Find the intervals in which the Function $y = (x + 1)^3(x - 3)^3$ is increasing or decreasing.

Problem- 2

Show that the function f given by $f(x) = x^3 - 3x^2 + 4x, x \in R$ is strictly increasing on R .

Problem- 3

Find the intervals in which the function given by $f(x) = \sin 3x$, $x \in \left[0, \frac{\pi}{2}\right]$

Problem- 4

Find the intervals in which the function given by $f(x)=\sin x + \cos x, \ x \in [0, 2\pi]$ is strictly increasing or decreasing.

Problem- 5

Show that $y = \log(1 + x) - \left(\frac{2x}{2+x}\right)$, $x > -1$ is increasing function of x through out its domain.

Problem- 6

Show that $y = \frac{4\sin\theta}{2+\cos\theta} - \theta$, is increasing function of θ in $\left[0, \frac{\pi}{2}\right]$.

HOME ASSIGNMENT

Q1. Find the interval in which $f(x) = \tan x - 4x$, is increasing or decreasing on $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

Q2. Find the interval in which $f(x) = [x(x - 2)]^2$ is increasing or decreasing.

Q3. find the least value of a such that the function $f(x) = x^2 + ax + 1$ is increasing on $[1,2]$

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