

Reg. No.: 19BME1021

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VIT[®]

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test (CAT) – 1 August 2019

B. Tech	Semester	FALL 2019 - 2020
Calculus for Engineers	Code	MAT1011
Abhishek kumar singh Berin greeni A Poulomi de Felix A Dhivya	Slot	B1+TB1
90 Minutes	Class Nbr(s)	CH2019201000436 CH2019201000438 CH2019201000440 CH2019201000470 CH2019201000616
	Max. Marks	50

Answer all the Questions

Find using first and second derivative test for f to determine the intervals on which $f(x) = x^3 - 3x^2 + 1$ is increasing, decreasing, concave up and concave down. 1

Suppose that $f(x)$ is continuous and differentiable on $[6, 15]$, $f(6) = -2$ and if $f'(x) \leq 10$, what is the largest possible value for $f(15)$? 5

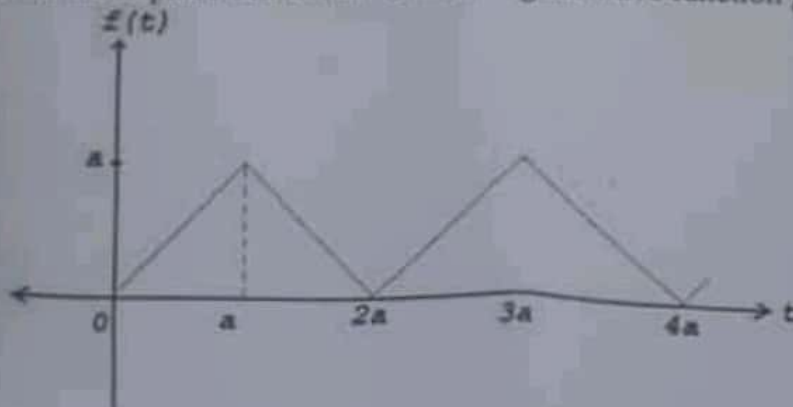
Find the area between the line $y = x + 1$ and the curve $y = x^2 - 1$. 5

A regulation-size football can be modeled as a solid of revolution formed by revolving the graph $y = -0.0944x^2 + 3.4$ $-5.5 \leq x \leq 5.5$ about the x -axis; sketch this model to find the volume of a football. (In the model, x and y are measured in inches). 10

Find two positive numbers whose product is 250 and such that the sum of the first and four times the second is a minimum. 5

Evaluate $L\left[\frac{\cos at - \cos bt}{t}\right]$. 5

Find the Laplace Transform of the triangular wave function given below:



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