

Course outline

How does an NPTEL online course work?

Prerequisite Assignment

Week 1

Week 2

Week 3

Week 4

 Isoperimetric Problems - Part 01

 Isoperimetric Problems - Part 02

 Isoperimetric Problems - Part 03

 Isoperimetric Problems - Part 04

 Isoperimetric Problems - Part 05

 Isoperimetric Problems - Part 06

 Quiz : Assignment 4

 Variational Calculus and its applications in Control Theory and Nanomechanics : Week 4 Feedback Form

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Download Videos

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Live Session

Assignment 4

The due date for submitting this assignment has passed.

Due on 2021-02-17, 23:59 IST.

As per our records you have not submitted this assignment.

1) Solve the isoperimetric problem

1 point

$$J(y) = \int_0^1 ((y')^2 + x^2) dx, \quad y(0) = y(1) = 0$$

and

$$\int_0^1 y^2 dx = 2$$

$$y = \pm 2 \sin(n\pi x), \quad n = 1, 3, 5, \dots$$

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

$$y = \pm 2 \sin(n\pi x), \quad n = 1, 3, 5, \dots$$

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 2) Determine the radius and height of the right circular cylinder of maximum volume subject to the constraint of having a surface area of 1 m^2
1 point

$$\text{Radius} = \frac{1}{\sqrt{2\pi}}, \quad \text{Height} = \frac{1}{\sqrt{3\pi}}$$

$$\text{Radius} = \frac{1}{\sqrt{2\pi}}, \quad \text{Height} = \frac{2}{\sqrt{6\pi}}$$

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$$\text{Radius} = \frac{1}{\sqrt{6\pi}}, \quad \text{Height} = \frac{3}{\sqrt{2\pi}}$$

$$\text{Radius} = \frac{1}{\sqrt{6\pi}}, \quad \text{Height} = \frac{2}{\sqrt{6\pi}}$$

$$\text{Radius} = \frac{2}{\sqrt{6\pi}}, \quad \text{Height} = \frac{1}{\sqrt{3\pi}}$$

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

$$\text{Radius} = \frac{1}{\sqrt{6\pi}}, \quad \text{Height} = \frac{2}{\sqrt{6\pi}}$$

 3) Among all the curves in C^2 joining a given point $(0, b)$ on the (positive) y -axis to a point on the (positive) x -axis, and enclosing a given area S together with the x - and y -axes, find the curve which generates the least area when rotated about the x -axis

1 point

$$\text{Straight line from } (b, 0) \text{ to } \left(\frac{2S}{b}, 0\right)$$

$$\text{Straight line from } (0, b) \text{ to } \left(\frac{2S}{b}, 0\right)$$

$$\text{Circle passing through } (b, 0) \text{ to } \left(\frac{2S}{b}, 0\right)$$

$$\text{Circle passing through } (0, b) \text{ to } \left(\frac{2S}{b}, 0\right)$$

$$\text{Any curve passing through } (b, 0) \text{ to } \left(\frac{2S}{b}, 0\right)$$

$$\text{Any curve passing through } (0, b) \text{ to } \left(\frac{2S}{b}, 0\right)$$

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

$$\text{Straight line from } (0, b) \text{ to } \left(\frac{2S}{b}, 0\right)$$