

## Course outline

How does an NPTEL online course work?

## Prerequisite Assignment

## Week 1

## Week 2

- Special cases / Invariance, Existence and Uniqueness of solutions - Part 01
- Special cases / Invariance, Existence and Uniqueness of solutions - Part 02
- Special cases / Invariance, Existence and Uniqueness of solutions - Part 03
- Special cases / Invariance, Existence and Uniqueness of solutions - Part 04
- Special cases / Invariance, Existence and Uniqueness of solutions - Part 05
- Special cases / Invariance, Existence and Uniqueness of solutions - Part 06

## Quiz : Assignment 2

- Variational Calculus and its applications in Control Theory and Nanomechanics : Week 2 Feedback Form

## Week 3

## Week 4

## Week 5

## Week 6

## Week 7

## Week 8

## Week 9

## Week 10

## Week 11

## Week 12

## Download Videos

## Text Transcripts

## Live Session

# Assignment 2

The due date for submitting this assignment has passed.

**Due on 2021-02-07, 23:59 IST.**

As per our records you have not submitted this assignment.

- 1) Assuming fixed end-points, Then which of the following is the extremals of the functional

1 point

$$F(y) = \int \sqrt{x^2 + y^2} \sqrt{1 + y'^2} dx$$

 where  $\alpha$  and  $\beta$  are arbitrary constants

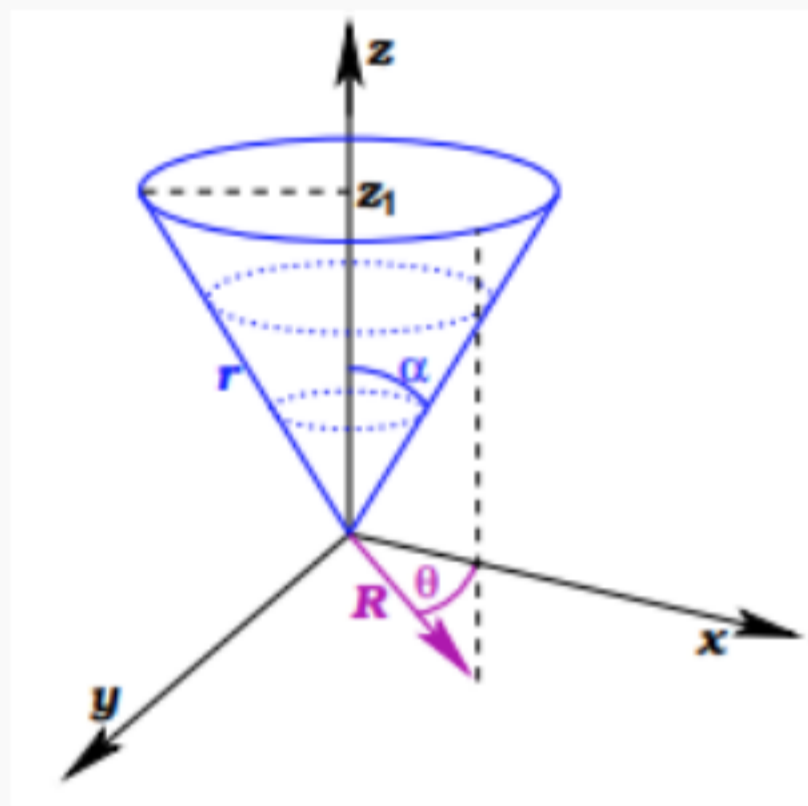
- $2xy \sin \alpha - (x^2 - y^2) \cos \beta = \alpha$
- $2xy \sin \alpha + (x^2 - y^2) \cos \alpha = \beta$
- $2xy \cos \alpha + (x^2 - y^2) \sin \alpha = \beta$
- $y(x) = x \tan \alpha \pm \sqrt{x^2 \sec^2 \alpha + \beta \sec \alpha}$
- $y(x) = x \tan \alpha \pm \sqrt{x^2 \sec^2 \alpha - \beta \sec \alpha}$
- $y(x) = x \tan \alpha \pm \sqrt{x^2 \sec^2 \alpha - \beta \sec \beta}$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $2xy \sin \alpha + (x^2 - y^2) \cos \alpha = \beta$   
 $y(x) = x \tan \alpha \pm \sqrt{x^2 \sec^2 \alpha - \beta \sec \alpha}$

- 2) Which of the following is the geodesics on a right circular cone (as shown in the figure)

1 point



- $r = \csc(v + \theta \sin \alpha)$
- $r = v \csc(v + \theta \sin \alpha)$
- $r = \mu \csc(v - \theta \sin \alpha)$
- $r = \mu \csc(v + \theta \sin \alpha)$
- $r = v \csc(\mu + \theta \sin \alpha)$
- $r = v \csc(\mu - \theta \sin \alpha)$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $r = \mu \csc(v - \theta \sin \alpha)$

- 3) If we minimize

1 point

$$I = \int_a^b [(y')^2 - y^2] dx$$

Then which of the following option is/are correct

- $y = \pm \sqrt{-c} \sin x, c < 0$
- $y = \pm \sqrt{c} \sin x, c > 0$
- $y = \pm \sqrt{-c} \cos x, c < 0$
- $y = \pm \sqrt{c} \cos x, c > 0$
- $y = \pm \sqrt{-c} \tan x, c < 0$
- $y = \pm \sqrt{c} \tan x, c > 0$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $y = \pm \sqrt{-c} \sin x, c < 0$