Assignment 5

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

Due on 2021-02-24, 23:59 IST.

1) Minimize *1 point*

$$I = \int_0^{x_1} \left[y^2 - (y')^2\right] dx$$

with left end point fixed and $y(x_1)$ is along the curve

$$x_1 = \frac{\pi}{4}$$

- $y \equiv 0$
- $y \equiv 1$
- $y = x$
- $y = x + 1$
- $y = x^2 - 1$
- $y = x^2 + 1$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$y \equiv 0$

2) Find the extremals for *1 point*

$$I = \int_0^1 \left[\frac{1}{2}(y')^2 + yy' + y' + y\right] dx$$

where end values of y are free

- $y = -\frac{1}{2}x + \frac{2}{3} + \frac{1}{3}x^2$
- $y = -\frac{1}{3}x + \frac{1}{2} + \frac{1}{2}x^2$
- $y = \frac{3}{2}x + \frac{2}{3} - \frac{1}{2}x^2$
- $y = -\frac{3}{2}x + \frac{1}{2} + \frac{1}{2}x^2$
- $y = -\frac{1}{2}x + \frac{1}{2} + \frac{3}{2}x^2$
- $y = \frac{3}{2}x + \frac{1}{3} + \frac{1}{3}x^2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$y = -\frac{3}{2}x + \frac{1}{2} + \frac{1}{2}x^2$

3) Solve the Euler-Lagrange equation associated with $I = \int_a^b \left[y^2 - yy' + (y')^2\right] dx$ *1 point*

- $\text{arc cosh}\ \frac{x}{\sqrt{c_1}} + c_2 = \pm y$
- $\text{arc cosh}\ \frac{y}{\sqrt{c_1}} + c_2 = \pm x$
- $\text{arc sinh}\ \frac{x}{\sqrt{c_1}} + c_2 = \pm y$
- $\text{arc sinh}\ \frac{y}{\sqrt{c_1}} + c_2 = \pm x$
- $\text{arc tanh}\ \frac{x}{\sqrt{c_1}} + c_2 = \pm y$
- $\text{arc tanh}\ \frac{y}{\sqrt{c_1}} + c_2 = \pm x$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\text{arc cosh}\ \frac{y}{\sqrt{c_1}} + c_2 = \pm x$