

36 Lecture - MTH101

Important Mcqs

Which formula is used to calculate the length of a curve?

- a) The area formula
- b) The perimeter formula
- c) The arc length formula
- d) The tangent line formula

Solution: c) The arc length formula is used to calculate the length of a curve.

What is the arc length formula?

- a) $L = \int_{[a,b]} \sqrt{1 + (dy/dx)^2} dx$
- b) $L = \int_{[a,b]} (dy/dx) dx$
- c) $L = \int_{[a,b]} \sqrt{1 + (dx/dy)^2} dy$
- d) $L = \int_{[a,b]} (dx/dy) dy$

Solution: a) The arc length formula is $L = \int_{[a,b]} \sqrt{1 + (dy/dx)^2} dx$.

Which of the following is a smooth curve?

- a) A piecewise linear curve
- b) A parabolic curve
- c) A circle
- d) A fractal curve

Solution: b) A parabolic curve is a smooth curve, as it has a continuous and differentiable derivative.

How do we find the length of a circle?

- a) $L = \pi r^2$
- b) $L = 2\pi r$

c) $L = \pi d$

d) $L = 2\pi r$

Solution: b) The length of a circle is given by the formula $L = 2\pi r$.

How do we find the length of a straight line segment?

a) $L = x_2 - x_1$

b) $L = y_2 - y_1$

c) $L = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

d) $L = (x_2 - x_1) + (y_2 - y_1)$

Solution: c) The length of a straight line segment is given by the distance formula $L = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.

Can we use the arc length formula for non-smooth curves?

a) Yes

b) No

Solution: a) Yes, we can use the arc length formula for non-smooth curves by dividing the curve into small sections and approximating its length using the formula for each section.

What is the length of the x-axis?

a) 0

b) 1

c) -1

d) ?

Solution: a) The length of the x-axis is 0, as it is a straight line with no width.

What is the length of the unit circle?

a) ?

b) 2?

c) 3?

d) 4?

Solution: b) The length of the unit circle is 2π , as it has a radius of 1.

How do we find the length of an ellipse?

- a) Using a simple formula
- b) Using numerical methods
- c) Using the arc length formula
- d) Using the Pythagorean theorem

Solution: b) The length of an ellipse cannot be found using a simple formula, but it can be approximated using numerical methods.

Can we use the Pythagorean theorem to find the length of a curve?

- a) Yes
- b) No

Solution: b) No, the Pythagorean theorem cannot be used to find the length of a curve, as it only applies to right triangles.