

# 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  $2\pi$ , 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.**