

# 37 Lecture - MTH101

## Important Subjective

What is the formula for calculating the surface area of a surface of revolution?

Answer: The formula is  $A = 2\pi \int_a^b f(x) \sqrt{1 + (f'(x))^2} dx$ .

How is the formula for the surface area of a surface of revolution derived?

Answer: The formula is derived by considering a small section of the curve that is being rotated and finding the surface area of that section.

What does  $f(x)$  represent in the formula for the surface area of a surface of revolution?

Answer:  $f(x)$  represents the function that defines the curve being rotated.

What does  $f'(x)$  represent in the formula for the surface area of a surface of revolution?

Answer:  $f'(x)$  represents the derivative of the function that defines the curve being rotated.

What is the axis of rotation?

Answer: The axis of rotation is the line or axis about which the curve is being rotated to form a three-dimensional shape.

Can the formula for the surface area of a surface of revolution be used to find the surface area of other three-dimensional shapes?

Answer: Yes, the formula can be used to find the surface area of other three-dimensional shapes by rotating their cross-sectional area about an axis.

What is the practical application of the surface area of a surface of revolution in engineering?

Answer: The surface area of a surface of revolution can be used in engineering to calculate the surface area of objects with curved surfaces, such as turbine blades or airplane wings.

How is the surface area of a surface of revolution useful in architecture?

Answer: The surface area of a surface of revolution can be used in architecture to determine the surface area of domes and other curved structures.

Is the formula for the surface area of a surface of revolution a calculus concept or an analytical geometry concept?

Answer: The formula is a concept in both calculus and analytical geometry.

What is the relationship between a two-dimensional curve and a three-dimensional shape in the context of the surface area of a surface of revolution?

Answer: The surface area of a surface of revolution is calculated by rotating a two-dimensional curve to form a three-dimensional shape.