

35 Lecture - MTH101

Important Subjective

What is the formula for finding the volume of a solid using cylindrical shells?

Answer: The formula is $V = \int 2\pi rh \, dx$, where r is the radius of the shell, h is the height of the shell, and dx is the width of the shell.

What is the difference between cylindrical shells and disks/washers for finding volume?

Answer: Cylindrical shells are used to find the volume of a solid with a curved boundary, while disks/washers are used to find the volume of a solid with a flat boundary.

How do you determine the height of a cylindrical shell for volume calculation?

Answer: The height of the cylindrical shell is determined by subtracting the function value of the upper curve from the function value of the lower curve.

Can you use cylindrical shells to find the volume of a solid with a circular cross-section?

Answer: Yes, cylindrical shells can be used to find the volume of a solid with a circular cross-section, as long as the axis of rotation is perpendicular to the circular cross-section.

What is the formula for finding the radius of a cylindrical shell?

Answer: The radius of a cylindrical shell is determined by the distance between the axis of rotation and the curve being rotated.

Can you use cylindrical shells to find the volume of a solid with a non-uniform cross-section?

Answer: Yes, cylindrical shells can be used to find the volume of a solid with a non-uniform cross-section, as long as the axis of rotation is perpendicular to the cross-section.

How do you determine the width of a cylindrical shell for volume calculation?

Answer: The width of the cylindrical shell is determined by the size of the intervals used in the integration process.

What is the general process for finding the volume of a solid using cylindrical shells?

Answer: The general process involves identifying the axis of rotation, determining the limits of integration, finding the radius and height of each shell, calculating the volume of each shell using the cylindrical shell formula, and then summing the volumes of all the shells.

Can you use cylindrical shells to find the volume of a solid with a slanted boundary?

Answer: Yes, cylindrical shells can be used to find the volume of a solid with a slanted boundary, as long as the axis of rotation is perpendicular to the slanted boundary.

How does the volume calculation using cylindrical shells differ from the volume calculation using disks/washers?

Answer: The volume calculation using cylindrical shells involves summing the volumes of multiple shells, while the volume calculation using disks/washers involves summing the volumes of multiple disks/washers.