Part 2 of Section 6.2

Volumes of Solids

by

Method of Cross Sections

*(specially for those solids which are **NOT** solids of revolution)*

Learning outcomes

After completing this section, you will inshaAllah be able to

1. use method of cross section to find volume of solids

Also called method of slicing

- We learn this specially for solids that are not solids of revolution
- But it can also be used for solids of revolution. Just remember that the disk/washer method (see 6.2.1) and shell method (see 6.3) are easier methods for finding volume of solids of revolution.

Recall from page 6.2$_3$

Method of volume by cross-sections

Cross-sections perpendicular to X-axis

Let S be a solid bounded by $x=a$, $x=b$ and the area of cross-section (perpendicular to X-axis) at x is $A(x)$ then

$$V=\int_a^b A(x)dx$$

Thinking that solid lies along X-axis

Cross-section perpendicular to Y-axis

Let S be a solid bounded by $y=c$, $y=d$ and the area of cross-section (perpendicular to Y-axis) at y is $A(y)$ then

$$V=\int_c^d A(y)dy$$

Thinking that solid lies along Y-axis

Main task

- To find $A(x)$, $A(y)$
  - need tricks or formulas from e.g. geometry, trigonometry etc

See examples 1, 2, 3 done in class