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Math 31A Lecture Notes: Mean Value and Areas of Solids of Revolution

Average

Average of the value of

Average value of on

Definition; Mean value Theorem:

The average value (mean value) of an integrable function on is defined by:

Example 1: Find the average value of on

Solution:

Example 2: A monkey named Larry jumps in the air with an initial velocity of 6 m/s.

Using Galileo’s formula for his height ( m/s):

Compute the average velocity while in the air

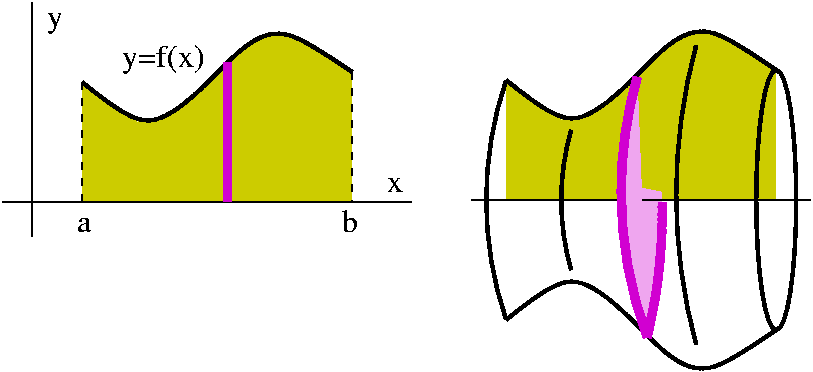
Solution:

Larry is in the air , for . The velocity is given by:

His average velocity

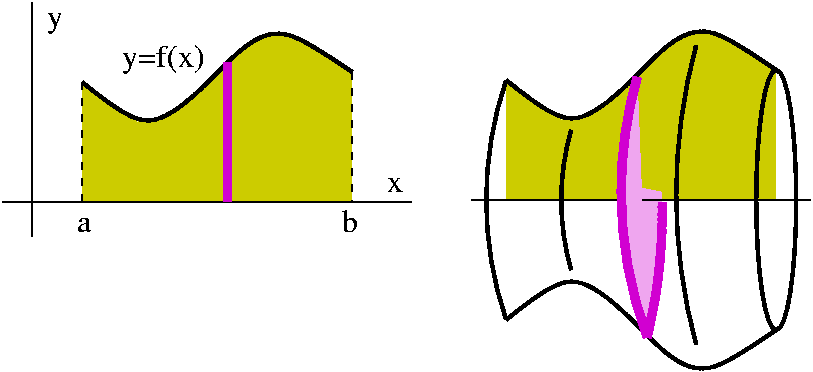
3 m/s

Definition; Solid of Revolution: A SoR is obtained by rotating a region about an axis



Goal: Compute the volume of a solid of revolution

Suppose: or

 area of vertical cross section

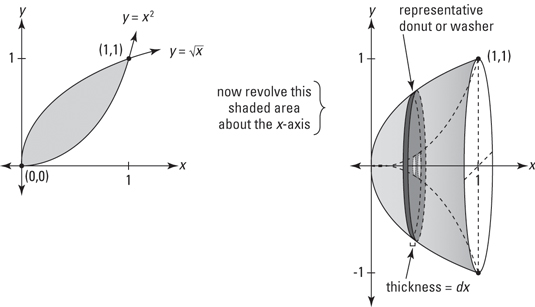
Hence, the volume of the solid obtained by

Rotating the region under the graph of a

Function is given by:

Example 3: Compute the volume V of the solid of revolution obtained by rotating the region under the graph about the x-axis for

Variation: We can also rotate the region between two graphs



Assuming then

! Do not take