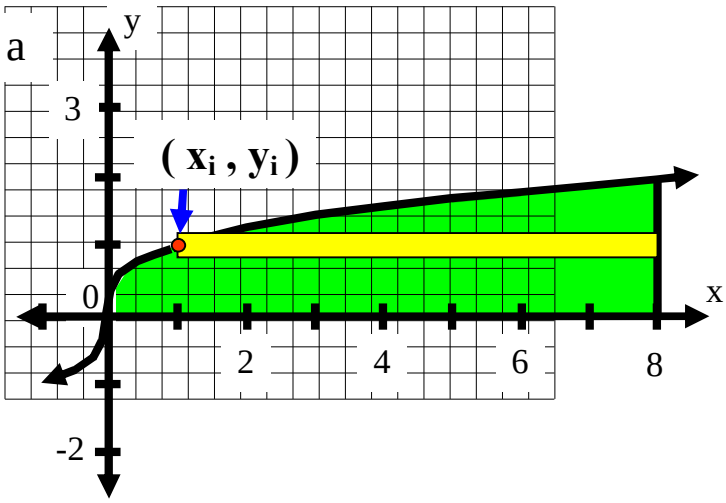
Calculus Worksheet #1 Unit 11 Selected Solutions

Use ñdisksò to find the volume generated by rotating the given region about the given line. For each problem, you must

a) sketch the generating region, showing a typical generating rectangle,
b) write an expression for the volume generated by this rectangle,
c) express the exact volume of the solid as a definite integral, and
d) evaluate the integral.

2B. The region in the first quadrant bounded by $x = y^3$, the x-axis, and the line $x = 8$ is rotated about the line $x = 8$.

a



Disks: $V = \pi r^2 h$

$r = 8 - x_i = 8 - y_i^3$

$h = \Delta y$

b $V_i = \pi(8 - y_i^3)^2 \, \Delta x$

c $V = \pi \int_0^2 (8 - y_i^3)^2 dx$

d $V \approx 259$ cu. units