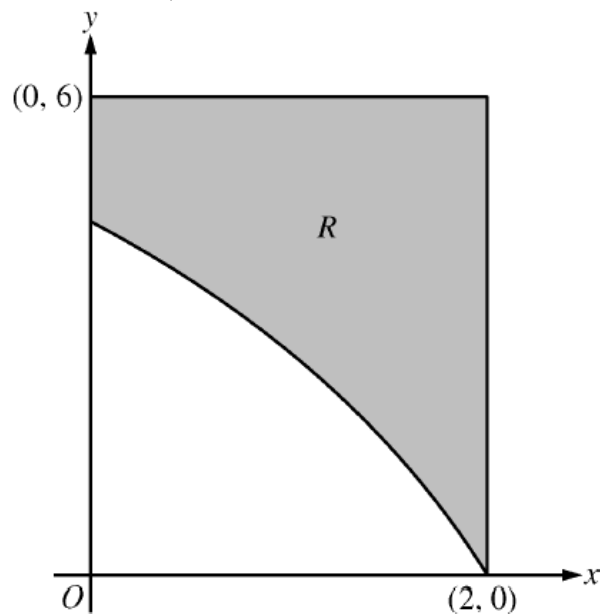


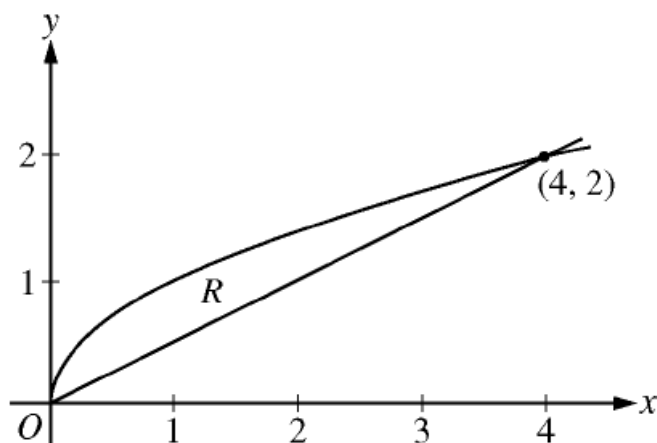
Calculator Active (Based on 2010 Form B #1)



In the figure above, R is the shaded region in the first quadrant bounded by the graph of $y = 4\ln(3 - x)$, the horizontal line $y = 6$, and the vertical line $x = 2$.

- Find the area of R .
- Find the volume of the solid generated when R is revolved about the horizontal line $y = 8$.
- Find the volume of the solid generated when R is revolved about the vertical line $x = -4$.
- The region R is the base of a solid. For this solid, each cross section perpendicular to the x -axis is a semicircle. Find the volume of the solid.
- Find the perimeter for the bounded region R .

Calculator Inactive (Based on 2009 Form B #4)



Let R be the region bounded by the graphs of $y = \sqrt{x}$ and $y = \frac{x}{2}$, as shown in the figure above.

(a) Find the area of R .

(b) Write, but do not evaluate, an integral expression for the volume of the solid generated when R is rotated about the horizontal line $y = 2$.

(c) Write, but do not evaluate, an integral expression for the volume of the solid generated when R is rotated about the vertical line $x = 4$.

(d) The region R is the base for a solid. For this solid, the cross sections perpendicular to the x -axis are squares. Find the volume of this solid.

(e) Region R can be divided into two equal areas by the line $y = k$. Write, but do not evaluate, an integral expression that would find the value of $y = k$.