

## Calculus Worksheet #3 Unit 11

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Use the shell method to find the volume generated by rotating the given region about the given line.

For each problem, you must

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

Show all of your work neatly organized on graph paper.

- The region enclosed by  $y = 4x - x^2$  and the x-axis is rotated about the (A) y-axis ; (B) line  $x = -1$ .**
- The region in the first quadrant enclosed by  $y = x^3$  and  $y = 4x$  is rotated about the x-axis.**
- The region enclosed by  $y = x^2 - 2x - 6$  and  $y = 2x - 6$  is rotated about the y-axis.**
- The loop of  $y^2 = 2x^2 - x^3$  is rotated about the y-axis.**