

MATHEMATICS 201-203-RE

Integral Calculus

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XIII - Volumes of Solids of Revolution

- Find the volume of the solid obtained by rotating the region bounded by the given curves about the specified line. Use the disk or washer method.
 - $y = \sqrt{9-x^2}$, $y = 0$, $-1 \leq x \leq 3$; about the x -axis
 - $y = \frac{1}{x}$, $y = 0$, $x = 1$, $x = 2$; about the x -axis
 - $y^2 = 4x$, $y = 4$, $x = 0$; about the y -axis
 - $y^2 = x^3$, $y = 8$, $x = 0$; about the y -axis
 - $y = x^2 + 1$, $y = x + 3$; about the x -axis
 - $y = \sec x$, $y = \sqrt{2}$, $-\frac{\pi}{4} \leq x \leq \frac{\pi}{4}$; about the x -axis
 - $y = x^3$, $y = 0$, $x = 2$; about the y -axis
 - $y^2 = 4x + 16$, $x = 0$; about the y -axis
 - $y = x^2$, $y^2 = x$; about the line $x = -1$
 - $y = 4x - x^2$, $y = x$; about the line $x = 3$
 - $y = x^3$, $y = 8$, $x = 0$; about the line $y = 8$
 - $y = \frac{1}{x}$, $y = 0$, $x = 1$, $x = 4$; about the line $y = 4$
- Find the volume of the solid obtained by rotating the region bounded by the given curves about the specified line. Use the shell method.
 - $y = \frac{1}{x}$, $y = 0$, $x = 1$, $x = 3$; about the y -axis
 - $3x - 2y + 1 = 0$, $y = x$, $x = 1$, $x = 3$; about the y -axis
 - $x = 4\sqrt{y}$, $y = 4$, $x = 0$; about the x -axis
 - $y = \frac{1}{x}$, $y = 0$, $x = 1$, $x = 2$; about the x -axis
 - $y = x^2$, $y = 4x - x^2$; about the line $x = 4$
 - $y = 4x - x^2$, $y = 0$; about the line $x = 5$
 - $y = x^3$, $y = 27$, $x = 0$; about the line $y = 27$
- Using the best method available, find the volume of the solid obtained by rotating the region bounded by $y = x$, $y = x^2 - 6$ revolved about
 - $x = 3$
 - $y = 3$
 - $x = -3$
 - $y = -6$
- Using the best method available, find the volume of the solid obtained by rotating the region bounded by $y = x$, $y = 2 - x$ and $y = 0$ revolved about
 - the x -axis
 - the y -axis
 - $x = -1$
 - $y = 4$

