Math 152 Week in Review: Section 6.2

Volume of a solid: $V = \int_a^b A(x)\ dx$ or $V = \int_a^b A(y)\ dy$

$A(x)$ represents the area of the slice and the slice is perpendicular to the $x-$axis.

$A(y)$ represents the area of the slice and the slice is perpendicular to the $y-$axis.

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1. The base of a solid is the region enclosed by the ellipse $\frac{x^2}{16}+\frac{y^2}{36}=1$. Cross-sections perpendicular to the $y-$axis are squares. Find the volume of the solid.

2. The base of a solid is the region enclosed by $x = y^2 - 9$ and the $x = 7$. Cross-sections perpendicular to the $x-$axis are equilateral triangles. Find the volume of the solid.

3. The base of a solid is the region enclosed by $y = 4 - x^2$ and the $x-$axis. Cross-sections perpendicular to the $y-$axis are quarter circles. Find the volume of the solid.

4. The base of a solid is a triangular region with vertices $(0, 4)$, $(2, 0)$, and $(-2, 0)$. Cross-sections perpendicular to the $y-$axis are isosceles triangles with the height equal to half the base. Find the volume of the solid.

5. The base of a solid is the region enclosed by $y = \sqrt{x+5}$, $x = 4$ and $y = 0$. Cross-sections perpendicular to the $y-$axis are semicircles. Setup the integral to find the volume of the solid.

6. Find the volume of the solid obtained by rotating the region bounded the curves about the $x-$axis.

   $y = \dfrac{2}{x}$ $\quad x-$axis $\quad x = 1 \quad x = 4$

7. Find the volume of the solid obtained by rotating the region bounded the curves about the $y-$axis.

   $x^2 = 4y \qquad y-\text{axis} \qquad y = 7$

8. Find the volume of the solid obtained by rotating the region bounded the curves about the $y-$axis.

   $y = \ln(x) \qquad x-\text{axis} \qquad x = e$

9. Set up the integral(s) that would find the volume of the solid obtained by rotating the region bounded the curves about the $x-$axis.

   $y = 11 - x^2 \qquad y = 2$

10. Set up the integral(s) that would find the volume of the solid obtained by rotating the region bounded the curves about the line $x = 7$.

    $x = y^2 + 3 \qquad x = 7$

11. Set up the integral(s) that would find the volume of the solid obtained by rotating the region bounded the curves about the line $x = 1$.

    $x = y^2 + 3 \qquad x = 7$

12. Set up the integral(s) that would find the volume of the solid obtained by rotating the region bounded the curves about the line $y = 5$.

    $y = \sqrt{x+1}$ $\quad$ $x-$axis $\quad$ $x = 8$

13. Set up the integral(s) that would find the volume of the solid obtained by rotating the region bounded the curves about the line $y = -2$.

    $y = x^2$ $\quad$ $y = 18 - x^2$