

1. Find the area of the region between $y = x^2$ and $y = x + 2$ from $x = 0$ to $x = 1$.

2. Find the area of the region bounded by the line $y = x$ and the parabola $y = 6 - x^2$.

3. Find the area of the region bounded by $y = x^3$ and $y = x$.

4. Find the area of the region between $x = y^2$ and $x = 32 - y^2$ from $y = -2$ to $y = 2$.

5. Find the area of the region between lines $x = -2y + 5$, $x = y - 1$ and $y = 0$.

6. Find the area of the region between $x = -y^2$ and $x = y - 2$.

7. The base of a certain solid is a circle with diameter AB of length $2a$. Find the volume of the solid if each cross section perpendicular to AB is a square.

8. The base of a certain solid is the region in the xy -plane bounded by the parabolas $y = x^2$ and $x = y^2$. Find the volume of this solid if every cross section perpendicular to the x -axis is a square with base in the xy -plane.

9. Find the volume of a frustum of a pyramid with square base of side b , square top of side a and height h .

10. Find the volume of the solid which is generated by rotating the region bounded by $y = \sin x$ on $[0, \pi]$ and $y = 0$ about the x -axis.

11. Verify the formula $V = \frac{1}{3}\pi r^2 h$ for the volume of the circular cone with base radius r and height h .

12. Find the volume of the solid generated by rotating the region bounded by $y = 1 - x^2$, lines $x = -1$ and $x = 1$ about the line $y = 2$.

13. Determine the volume of the solid obtained by rotating the region bounded by $x = 5 - x^2$ and $x = 1$ about the y -axis.