Class 16: More Areas and Volumes

Calculus II

College of the Atlantic. Feb 13, 2023

1. Find the area of the region between the functions $y = \sqrt{x}$ and $y = x$. Slice vertically.

2. Find the area of the region between the functions $y = \sqrt{x}$ and $y = x$. Slice horizontally.

3. The area between the functions $y = \sqrt{x}$ and $y = x$ is rotate about the x-axis. What is the volume of the resulting shape? Slice vertically.

4. The area between the functions $y = \sqrt{x}$ and $y = x$ is rotate about the x-axis. What is the volume of the resulting shape? Slice horizontally.

5. Find the volume of the solid obtained by rotating the region bounded by $y = x^2$ and $x = 2$ around the x-axis.

6. Find the volume of the solid obtained by rotating the region bounded by $y = x^2$, $x = 2$, and $y = 0$ around the y-axis.

7. The region bounded by the curves $y = x$ and $y = x^2$ is rotated about the line $y = 3$. What is the volume of the resulting solid?

8. A hemispherical bowl of radius 12 inches is filed to a depth of 3 inches. Find the volume of water in the bowl.

9. A hemispherical bowl of radius r is filled to a depth of h. Find a formula for the formula of the volume of the water. Check your formula by examining what happens when $h \to r$.