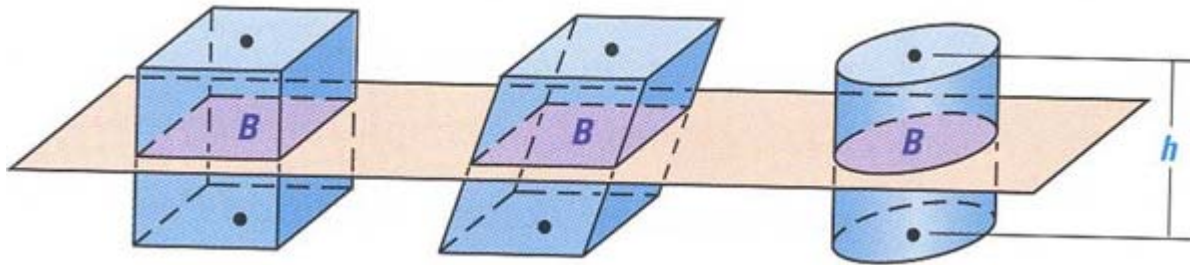


## Cavalieri's Principle - Step-by-Step Lesson



Let  $A(x) = \sqrt[7]{x^3}$  describes the area of a cross-section of a solid at  $x$  (perpendicular to the  $x$ -axis). Find the volume of solid from  $x=0$  to  $x=1$ .

### Explanation:

$$V = \int_a^b A(x) dx$$

$$V = \int_0^1 \sqrt[7]{x^3} dx$$

$$V = \int_0^1 x^{\frac{3}{7}} dx$$

$$V = \left. \frac{x^{\frac{3}{7}+1}}{\frac{3}{7}+1} \right|_0^1$$

$$V = \left. \frac{7}{10} x^{\frac{10}{7}} \right|_0^1$$

$$V = \frac{7}{10} \left( 1^{\frac{10}{7}} - 0^{\frac{10}{7}} \right)$$

Step 3) so the volume of solid is,  $V = \frac{7}{10}$

