

Section 6.5 p. 469; 1, 5, 9, 13, 17, 21, 25, 29

①

$$y = x^3, y = 0, x = 1, x = 2$$

graphs:

Interval: $[1, 2]$

$$y = x^3 \text{ (cube } \nearrow \text{)}$$

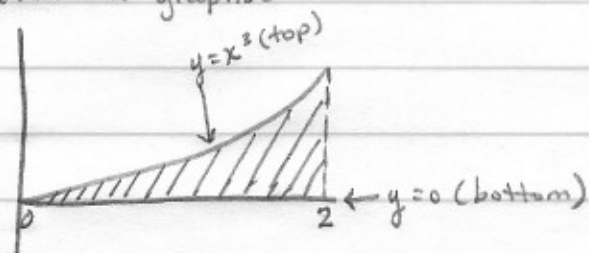
$$y = 0 \text{ (x-axis)}$$

Check to see if these graphs intersect within the interval $[1, 2]$.

$$x^3 = 0$$

$x = 0$ No, b/c 0 is not between $[1, 2]$.

Sketch the graphs:



Set the problem up:

$$\int_1^2 [(x^3) - (0)] dx$$

$$\int_1^2 x^3 dx$$

$$\left. \frac{x^4}{4} \right|_1^2 = \left(\frac{2^4}{4} \right) - \left(\frac{1^4}{4} \right) = 4$$

⑤

$$y = x^2, y = x, x = 0, x = 1$$

graphs: interval: $[0, 1]$

$$y = x^2 \text{ (parabola)}$$

$$y = x \text{ (line)}$$

Check to see if these curves intersect within the interval $[0, 1]$.

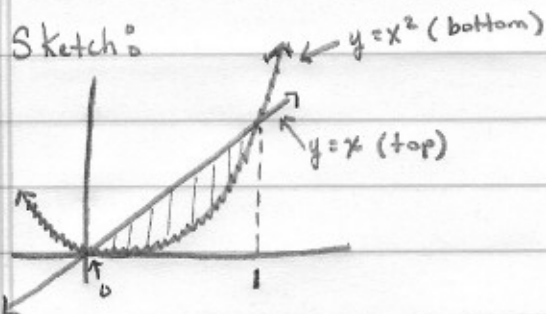
$$x^2 = x$$

$$x^2 - x = 0$$

$$x(x-1) = 0$$

No.

$x = 0$ $x = 1$ (Endpoints of the given interval.)



Set up the problem:

$$\int_0^1 (x - x^2) dx$$

$$\left. \frac{x^2}{2} - \frac{x^3}{3} \right|_0^1 = F(1) - F(0)$$

$$= \left[\frac{(1)^2}{2} - \frac{(1)^3}{3} \right] - \left[\frac{(0)^2}{2} - \frac{(0)^3}{3} \right]$$

$$= \left[\frac{1}{2} - \frac{1}{3} \right] - 0$$

$$= \frac{1}{6}$$