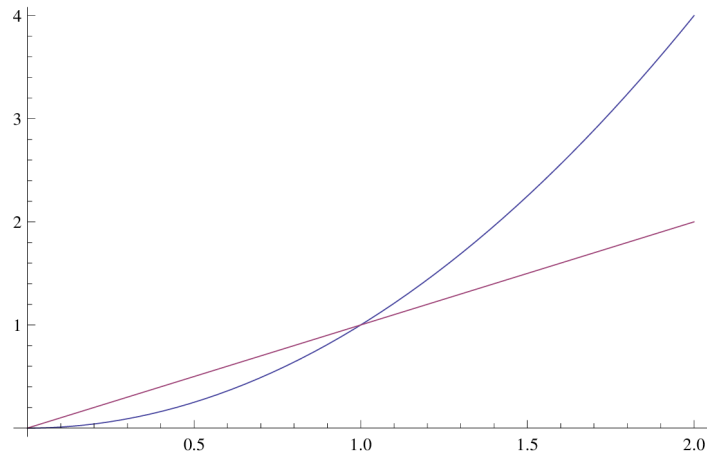


Answer on Question 42947, Math, Calculus



a) First, let us use vertical strip method.

The area is the sum of two areas: $0 \leq x \leq 1$ (x^2 is under x) and $1 \leq x \leq 2$ (x is under x^2):

$$S^{vert} = \int_0^1 (x - x^2) dx + \int_1^2 (x^2 - x) dx = \left(\frac{x^2}{2} - \frac{x^3}{3} \right) \Big|_0^1 + \left(\frac{x^3}{3} - \frac{x^2}{2} \right) \Big|_1^2 = 1$$

b) The inverse functions of given functions which bound the area are $x = \sqrt{y}$, $x = y$. Thus, the area is

$$S^{hor} = \int_0^1 (\sqrt{y} - y) dy + 2 \cdot 2 - \int_2^4 \sqrt{y} dy + \int_1^2 (y - \sqrt{y}) dy = \frac{25}{6} + \frac{1}{6}(13 - 8\sqrt{2}) + \frac{4}{3}(-4 + \sqrt{2}) = 1 .$$