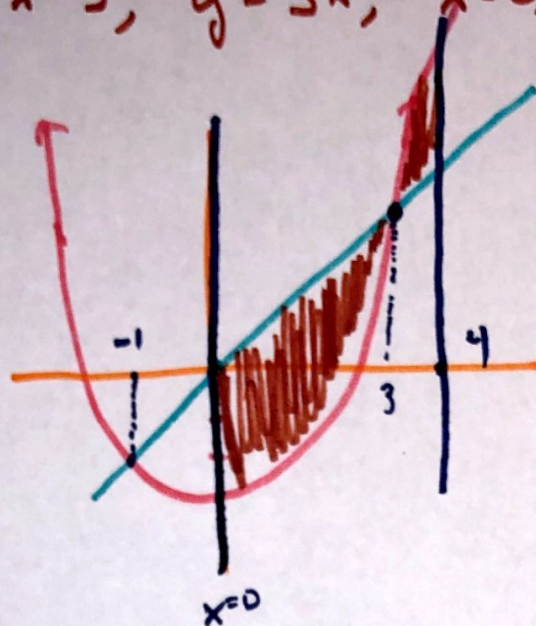


§6.1

Find the area bounded by

$y = x^2 + x - 3$, $y = 3x$, $x = 0$, $x = 4$



$$x^2 + x - 3 = 3x$$

$$x^2 - 2x - 3 = 0$$

$$(x - 3)(x + 1) = 0$$

$$x = -1, 3$$

$$A = \int_0^4 |(x^2 + x - 3) - (3x)| dx =$$

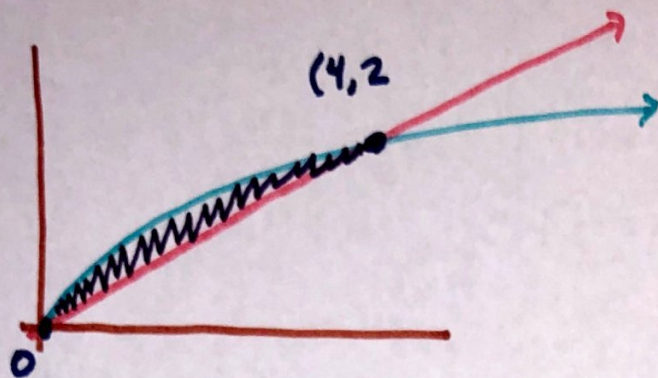
$$= \int_0^3 3x - (x^2 + x - 3) dx + \int_3^4 (x^2 + x - 3) - 3x dx$$

$$= \int_0^3 -x^2 + 2x + 3 dx + \int_3^4 x^2 - 2x - 3 dx$$

$$= \left[-\frac{x^3}{3} + x^2 + 3x \right]_0^3 + \left[\frac{x^3}{3} - x^2 - 3x \right]_3^4 = \dots$$

Find the area bounded by

$$y = \sqrt{x} \text{ and } y = \frac{1}{2}x$$



$$\sqrt{x} = \frac{1}{2}x$$

$$x = \frac{x^2}{4}$$

$$x^2 - 4x = 0$$

$$x(x-4) = 0$$

$$x = 0, 4$$

$$A = \int_0^4 \sqrt{x} - \frac{1}{2}x \, dx = \frac{2}{3}x^{3/2} - \frac{x^2}{4} \Big|_0^4$$

$$= \left(\frac{2}{3}(4)^{3/2} - \frac{16}{4} \right) - (0 - 0)$$

$$= \frac{16}{3} - 4 = \frac{16}{3} - \frac{12}{3} = \left(\frac{4}{3} \right)$$