

Find the area of the region enclosed by the curve $y = x^2 + 5x - 1$ and the line $y = 2x + 3$.
Give the exact answer.

$$x^2 + 5x - 1 = 2x + 3$$

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

$$x = -4; 1$$

$$\left(-\frac{5}{2}; -\frac{29}{4}\right)$$

$$S_{[-4;1]}(x^2 + 3x - 4) =$$

$$= \frac{x^3}{3} + \frac{3}{2}x^2 - 4x \Big|_{-4;1} =$$

$$= \frac{1}{3} + \frac{3}{2} - 4 - \left(\frac{(-4)^3}{3} - 3/2 \cdot 4^2 - 16 \right) = -20.83$$

$$S_{[-4;1]}(2x + 3) dx - S_{[-4;1]}(x^2 + 5x - 1) dx =$$

$$= \frac{x^2}{2} + 3x \Big|_{-4;1} - \left(\frac{x^3}{3} + \frac{5x^2}{2} - x \right) \Big|_{-4;1} =$$

$$= \frac{1}{2} + 3 - 16 + 12 - \left(\frac{1}{3} + \frac{5}{2} - 1 - \left(\frac{(-4)^3}{3} + 5 \cdot 8 + 4 \right) \right) =$$

$$= 20.83$$

