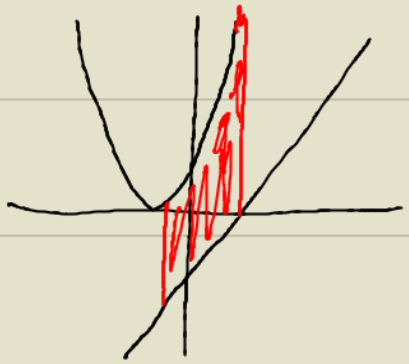
3. $y = x^2 + 3x + 2$ $\quad y = 3x - 5$ $\quad x = -1$ $\quad x = 2$



$$\int_{-1}^{2} \underbrace{(x^2+3x+2)}_{\text{GRAPH ABOVE}} - \underbrace{(3x-5)}_{\text{GRAPH BELOW}} \, dx$$

$$= \int_{-1}^{2} (x^2 + 3x + 2 - 3x + 5) \, dx$$

$$= \int_{-1}^{2} (x^2 + 7) \, dx$$

$$= \left[\frac{1}{3}x^3 + 7x \right]_{-1}^{2}$$

$$= \left(\frac{1}{3}(2)^3 + 7(2) \right) - \left(\frac{1}{3}(-1)^3 + 7(-1) \right)$$

$$= \frac{8}{3} + 14 - \left(-\frac{1}{3} - 7 \right)$$

$$= \frac{8}{3} + 14 + \frac{1}{3} + 7$$

$$= \frac{9}{3} + 21$$

$$= 3 + 21$$

$$= \boxed{24}$$