

$$11. \quad y = 9 - x^2 \quad y = x + 3$$

POI's of  $y = 9 - x^2$   
AND  $y = x + 3$

$$9 - x^2 = x + 3$$

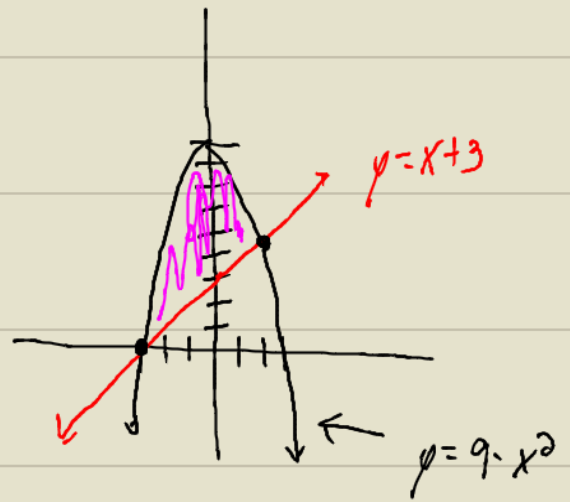
$$0 = x^2 + x + 3 - 9$$

$$0 = x^2 + x - 6$$

$$0 = (x + 3)(x - 2)$$

$$x + 3 = 0 \quad x - 2 = 0$$

$$x = -3 \quad x = 2$$



(PSD)

$$\int_{x=-3}^{x=2} \int_{y=x+3}^{y=9-x^2} dy dx$$

$$= \int_{x=-3}^{x=2} [y]_{y=x+3}^{y=9-x^2} dx$$

$$= \int_{x=-3}^{x=2} [9 - x^2 - (x + 3)] dx$$

$$= \int_{x=-3}^{x=2} (9 - x^2 - x - 3) dx$$

$$= \int_{x=-3}^{x=2} (-x^2 - x + 6) dx$$

$$= \left[ -\frac{1}{3}x^3 - \frac{1}{2}x^2 + 6x \right]_{x=-3}^{x=2}$$

$$= -\frac{1}{3}(2)^3 - \frac{1}{2}(2)^2 + 6(2) - \left( -\frac{1}{3}(-3)^3 - \frac{1}{2}(-3)^2 + 6(-3) \right)$$

$$= -\frac{8}{3} - 2 + 12 - \left( 9 - \frac{9}{2} - 18 \right)$$

$$= -\frac{8}{3} + 10 - 9 + \frac{9}{2} + 18$$

$$= 19 - \frac{16}{6} + \frac{27}{6}$$

$$= 19 + \frac{11}{6}$$

$$= \left( \frac{125}{6} \right)$$

$$\begin{array}{r} 19 \\ \frac{11}{6} \\ \hline 125 \\ \hline \end{array}$$