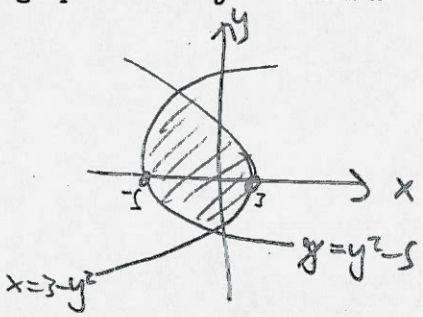
IN CLASS QUIZ 2

NAME:_____

1. Plot the graphs of $x = y^2 - 5$ and $x = 3 - y^2$.



(3)

2. Determine the points of intersection of the curves $x = y^2 - 5$ and $x = 3 - y^2$.

$y^2-5 = 3-y^2 \iff 2y^2 = 8 \iff y = \pm 2$

$y=2 \Rightarrow x = 2^2-5 = -1$
$y=-2 \Rightarrow x = (-2)^2-5 = -1$

(2)

So points of intersection are $(-1,-2)$ and $(-1,2)$

3. Determine the area of the region bounded by the graphs of $x = y^2 - 5$ and $x = 3 - y^2$.

$$\text{Area} = \int_{-2}^{2} x_{\text{right}} - x_{\text{left}}\, dy \qquad (1)$$

$$= \int_{-2}^{2} (3-y^2) - (y^2-5)\, dy = \int_{-2}^{2} 8 - 2y^2\, dy \qquad (2)$$

$$= \left[8y - \tfrac{2}{3}y^3\right]_{-2}^{2} = \left(16 - \tfrac{16}{3}\right) - \left(-16 + \tfrac{16}{3}\right)$$

$$= 32 - \frac{32}{3} = \frac{96}{3} - \frac{32}{3} = \frac{64}{3} \qquad (2)$$