

1) a) $y_1 = f(x)$ $y_2 = g(x)$

$y_1 = y_2$ @ $x = 0.178 - A$

Area of $R = \int_0^A [y_2 - y_1] dx$
 $= 0.064$

c) WASHER - dx

$$V = \pi \int_A^1 [y_1 + 1]^2 dx - \pi \int_A^1 [y_2 + 1]^2 dx = 4.558$$

2) a) $y_1 = f(x)$

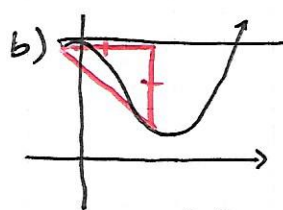
$y_1 = 4$ @ $x = 0$ & $x = 2.3$

WASHER

$$V = \pi \int_0^{2.3} [4 - (-2)]^2 dx - \pi \int_0^{2.3} [y_1 - (-2)]^2 dx$$

$$= 98.867$$

c) $\int_0^k (4 - y_1) dx = \int_k^{2.3} (4 - y_1) dx$



$$V = \int \frac{1}{2} b \cdot h$$

$$h = b$$

$$= \frac{1}{2} \int b^2$$

$$V = \frac{1}{2} \int_0^{2.3} [4 - y_1]^2 dx$$

$$= 3.573$$

3) $y = 2x$ $y = x^2$

a) Area = $\int_0^2 (2x - x^2) dx$
 $\left[x^2 - \frac{1}{3} x^3 + C \right]_0^2$
 $\boxed{4 - \frac{8}{3}}$

b) $V = \int_0^2 \sin\left(\frac{\pi}{2}x\right) dx$
 $= -\frac{2}{\pi} \cos\left(\frac{\pi}{2}x\right) + C \Big|_0^2$
 $= -\frac{2}{\pi} \cos(\pi) - \left(-\frac{2}{\pi} \cos 0\right)$
 $= \boxed{\frac{4}{\pi}}$

c) $\perp$ to y-axis dy

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

$$V = \int_0^4 \left[\sqrt{y} - \frac{1}{2}y \right]^2 dy$$