1. (a) $f(x) = 6 - x^2 = 0$
$$x = \pm \sqrt{6} \quad (\approx \pm 2.45)$$

(b) $A = \displaystyle\int_{-\sqrt{6}}^{\sqrt{6}} (6 - x^2)\, dx =$

$$= 19.5959... \approx 19.6$$
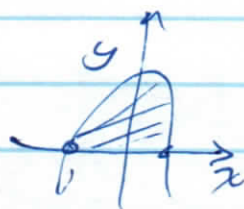
2. (a) $j = \pi$, $k = 2\pi \quad (\approx 6.28)$

(b) $V = \displaystyle\int_{\pi}^{2\pi} \pi \left((x-1) \sin x\right)^2 dx$

(c) $= 69.60192... \approx 69.6$

3. (a)   3
(b)   period $= \dfrac{2\pi}{\pi} = 2$
(c)   on graph

4. (a) $f\left(\frac{\pi}{4}\right) = \sin\left(\frac{\pi}{4} + \frac{\pi}{4}\right) + k = 6$
$$1 + k = 6$$
$$k = 5$$

(b)   min of $\sin(x) = -1$
min of $f(x) = -1 + 5 = 4$

(c) $\left(\begin{array}{c} -\frac{\pi}{4} \\ 5 \end{array}\right)$