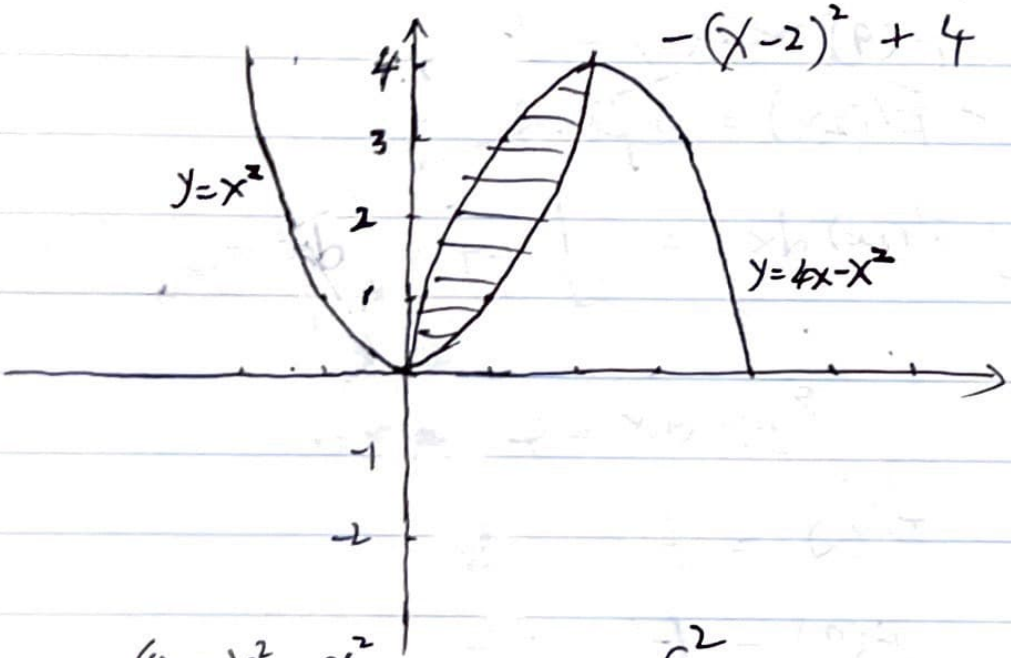
6.1: 14. $y=x^2$ $y=4x-x^2=$

$-(x^2-4x)=$

$-(x^2-4x+4)+4=$

$-(x-2)^2+4$




$4x-x^2=x^2$

$4x=2x^2$

$2x=x^2$

$x=0$ or $x=2$

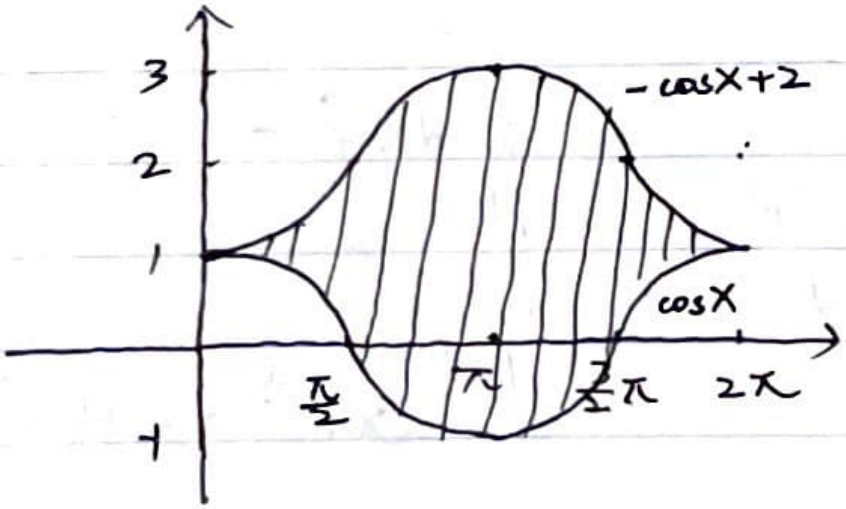
$$\int_0^2 4x-x^2-x^2\,dx =$$

$$\int_0^2 4x-2x^2\,dx =$$

$$\left(2x^2-\frac{2}{3}x^3\right)\Big|_0^2 =$$

$$8-\frac{16}{3}=\frac{8}{3}$$

6.1 : 16. $y = \cos x$ $y = 2 - \cos x$ $0 \le x \le 2\pi$



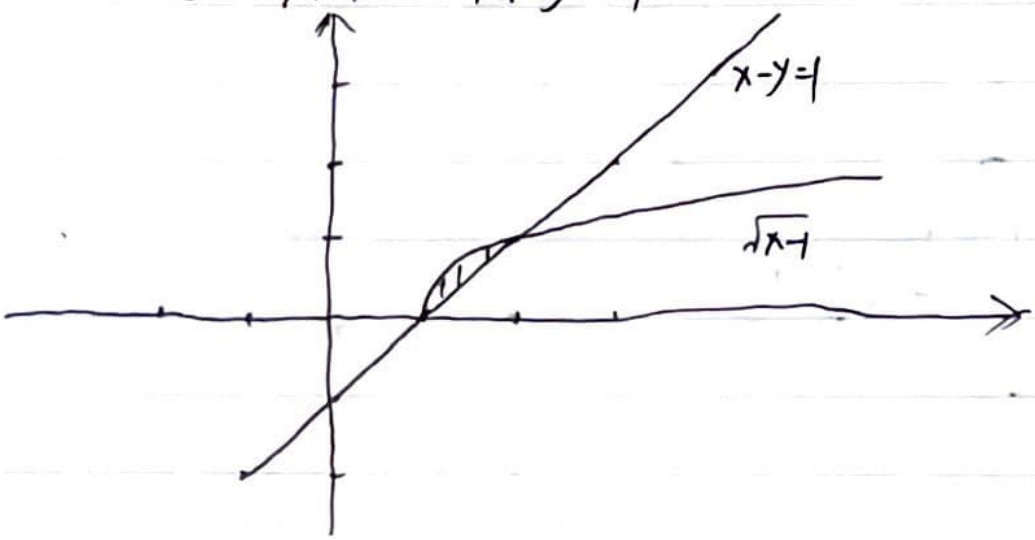

$$\int_0^{2\pi} -\cos x + 2 - \cos x \, dx =$$

$$\int_0^{2\pi} 2 - 2\cos x \, dx =$$

$$2\int_0^{2\pi} dx - 2\int_0^{2\pi} \cos x \, dx =$$

$$4\pi - 2 \sin x \Big|_0^{2\pi} = 4\pi$$

6.1 : 18 $y = \sqrt{x-1}$ $x - y = 1$




~~$\sqrt{x-1} = x$~~

$y = \sqrt{x-1}$ $x - y = 1$

$x = y + 1$

$x - 1 = y$

$\sqrt{x-1} = x - 1$

$x = 1$ or $x = 2$

$$\int_1^2 \sqrt{x-1} - (x-1)\, dx =$$

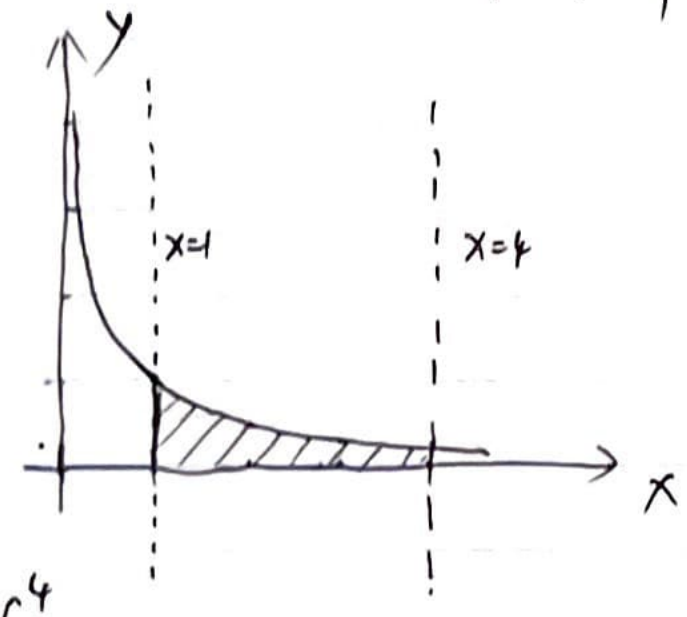
$$\int_1^2 (x-1)^{\frac{1}{2}} - x + 1\, dx =$$

$$\left(\frac{2}{3}(x-1)^{\frac{3}{2}} - \frac{1}{2}x^2 + x\right)\Big|_1^2 =$$

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

$$\frac{2}{3} - \frac{1}{2} = +\frac{1}{6}$$

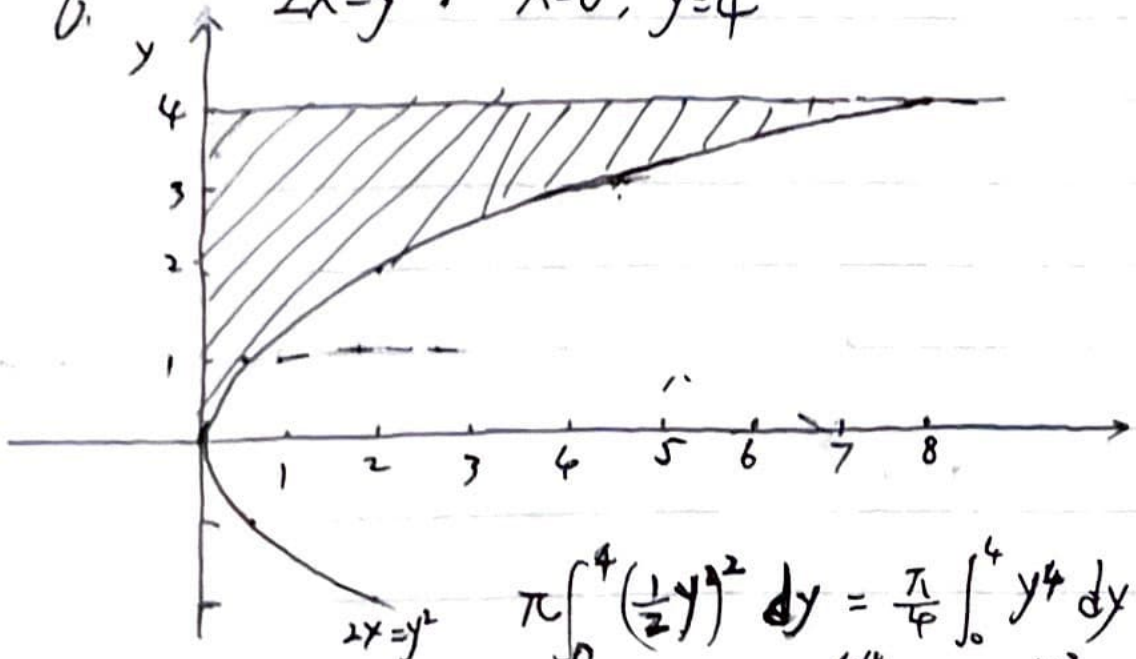
6.2. 2. $y=1/x$, $y=0$, $x=1$, $x=4$




$$\pi\int_1^4 \left(\frac{1}{x}\right)^2 dx = \pi\int_1^4 x^{-2}\,dx = \pi\left(-x^{-1}\right)\Big|_1^4 =$$

$$\pi\left(-\frac{1}{4}+1\right) = \frac{3}{4}\pi$$

6.2 6. $2x=y^2$, $x=0$, $y=4$




$$\pi\int_0^4 \left(\frac{1}{2}y\right)^2 dy = \frac{\pi}{4}\int_0^4 y^4\,dy = \frac{\pi}{4}\,\frac{y^5}{5}\Big|_0^4 =$$

$$\frac{4^4}{5}\pi = \frac{16^2}{5}\pi = \frac{256}{5}\pi$$