



Question 5:

a)  $y = 2\sqrt{25-x^2}$

$\therefore$  domain:  $\sqrt{25-x^2} \geq 0$

$\Rightarrow 25-x^2 \geq 0$

$\Rightarrow x^2 \leq 25$

$\Rightarrow -5 \leq x \leq 5$

$\therefore$  range of  $y$  is all real no, with  $-5 \leq x \leq 5$ .

b)

i)  $\log_{10} 2^{1000} = 1000 \log_{10} 2 = 1000 \times 0.301030$   
 $= 301.030$

ii)  $2^{10} = 1024$



c)

$$e = \theta \times r$$

$$\rightarrow 8 = \frac{\pi}{6} \times r$$

$$\Rightarrow r = \frac{48}{\pi} = 15.28 \text{ (cm)}$$

$$\Rightarrow r \approx 153 \text{ (mm)}$$

d)

$$\text{i)} \quad A = \frac{h}{2} [0 + 0 + 2 \times (1.3 + 1.7)] \quad \text{where } h = 4$$

$$\Rightarrow A = 2 (2 \times 2) = 8 \text{ (m}^2\text{)}$$

$$\text{ii)} \quad 1 \text{ hour} = 3600 \text{ (s)}, \quad v = 0.5 \text{ (ms}^{-1}\text{)}$$

$$\begin{aligned} \text{rate of volume pass thru this section in 1 hr} &= 8 \times 0.5 \times 3600 \\ &= 14400 \text{ (m}^3\text{s}^{-1}\text{)} \end{aligned}$$