



### Question 5.

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

$$\text{domain} \rightarrow -5 \leq x \leq 5$$

$$\text{range} \rightarrow 2 \leq y \leq 10$$

$$b) i) \log_{10}(2^{1000}) = \frac{\log_e 2^{1000}}{\log_e 10} = \frac{\log_e 2^{10} + \log_e 2^{10} + \log_e 2^{10}}{\log_e 10}$$

$$= 9.031$$

ii) 199 digits

$$c) 30^\circ = 30^\circ \times \frac{\pi}{180} = \frac{\pi}{6}$$

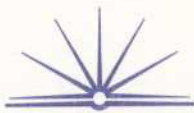
$$.8 = r \times \frac{\pi}{6}$$

$$\frac{48}{\pi} = r$$

$$15.27 = r$$

$$d) \text{trapezoidal rule} = \frac{4}{2} [0 + 0 + 2 [1.3 + 1.7]] \\ = 2 (2 \times (1.3 + 1.7)) \\ = 2 \times 6 = 12 \text{ m}^2$$

The appropriate volume of water that flows past this section is  $= 0.5 \text{ m s}^{-1} \times 3600 \text{ s} = 1800 \text{ m}$



$$\text{Volume of water} = 1800^{\text{m}} \times 12 \text{ m}^2 = 21600 \text{ m}^3$$