

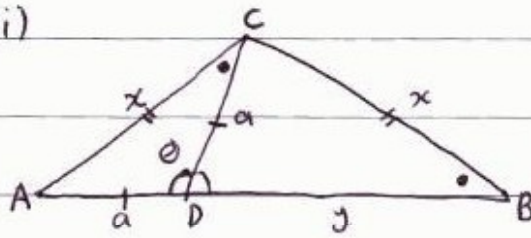
Start here for

Question Number:

10

Sample 3

a) (i)



\therefore both isosceles triangles

$$\bullet \angle ACD \equiv \angle ABC$$

$$\bullet \text{side } AC = \text{side } BC$$

$$\bullet \angle CDB \equiv \angle ADC$$

$$\bullet \text{side } AD = \text{side } CD$$

$$(ii) x^2 = a^2 + ay$$

$$(iii) y = a(1 - 2\cos\theta)$$

$$y' = (1 - 2\cos\theta)^{2a}$$

$$(iv) y \leq 3a$$

$$b) (i) V = \frac{\pi r^3}{3} (2 - 3\sin\theta + \sin^3\theta)$$

$$= \frac{\pi r^3}{3} (\sin\theta (2 - 3 + \sin^2\theta))$$

$$= \frac{\pi r^3}{3} (\sin\theta (-1 + \sin^2\theta))$$

$$(ii) \quad (1) \quad \frac{1}{2} \cos \theta$$
$$= 0.99996$$
$$= 0^\circ 59'$$

$$(2) \quad \frac{59}{10800} \quad \text{or} \quad 5.462962963 \times 10^{-3}$$

Additional writing space on back page.