

Question 5

$$a) i) T_n = a + (n-1)d$$

$$32 = 2 + (n-1)1.5$$

$$32 = 2 + 1.5n - 1.5$$

$$1.5n = 31.5$$

$$n = 21$$

she throws it 21 times

$$ii) \cancel{\sum_{n=1}^n \frac{1}{2}(2a + (n-1)d)} \quad \text{or} \quad \frac{1}{2}(n+1)$$

$$= \frac{21}{2}(2+32)$$

$$= 357 \text{ metres (the dog ran)}$$

$$b) \text{ Arc length} = r\theta$$

$$38 = 20\theta$$

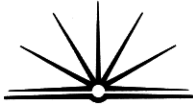
$$\theta = \frac{38}{20}$$

$$\theta = 1.9$$

$$= \frac{19}{10}$$

$$= \frac{19 \times 180}{10}$$

$$= 342^\circ$$



$$c) \quad y = x^2 - 8x + 4$$

$$i) \quad y' = 2x - 8$$

$$0 = 2x - 8$$

$$8 = 2x$$

$$x = 4$$

$$y = (4)^2 - 8(4) + 4$$

$$= -12$$

vertex occurs at $(4, -12)$

$y'' = 2 > 0$ is a minimum

$$ii) \quad y = x^2 - 8x + 4$$

$$x^2 = y + 8x - 4$$

$$x^2 = y + 4(2x - 1)$$

$$a = 2$$

focus occurs at $(4, -8)$