

$$\textcircled{9} \textcircled{1} \quad T_n = a + (n-1)d$$

$$n = ? \quad a = 2, \quad d = 1.5$$

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

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

$$31.5 = 1.5n$$

$$n = 21.$$

\therefore Catherine throwed the stick 21 times.

$$\textcircled{10} \quad S_n = \frac{n}{2} [2a + (n-1)d]$$

$$S_{21} = \frac{21}{2} [2(2) + (21-1)1.5]$$

$$= \frac{21}{2} [4 + 30]$$

$$= 357 \quad - \text{ For starting journey.}$$

$$\therefore 357 \times 2 = 714 \text{ m} \quad - \text{ whole journey.}$$

$$\textcircled{b} \quad l = r\theta.$$

$$38 = 20\theta$$

$$\theta = \frac{19}{10} \text{ (radians)}$$

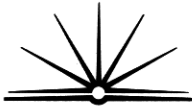
$$1^\circ = \frac{\pi}{180} \quad \pi^\circ = 180$$

$$\therefore \theta = \frac{19}{10} \times \frac{180}{\pi}$$

$$\therefore \theta = \frac{19}{10} \times \frac{180}{\pi}$$

$$= 108^\circ 51' 43''$$

$$= \cancel{108}^\circ 109^\circ$$



② ① $y = x^2 - 8x + 4$

$$\frac{dy}{dx} = 2x - 8 = 0, \text{ for stationary points/vertex.}$$

$$2x = 8.$$

$$x = 4.$$

$$\text{When } x = 4, \quad y = 4^2 - 8(4) + 4$$

$$= 16 - 32 + 4.$$

$$= -12$$

\therefore Vertex has coordinates $(4, -12)$

② (ii) focus $(0, a)$

$$x^2 = 4ay$$

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

$$4ay = 8x + y - 4.$$

$$a = \frac{8x + y - 4}{4y}$$

$$a = \frac{2x}{y} + \frac{1}{4} - \frac{1}{y}$$

$$\left(0, \frac{2x}{y} + \frac{1}{4} - \frac{1}{y}\right)$$