

Ex 5.3

①7 $a = 3, d = \frac{6-3}{3}, n = 12$

$$S_{12} = \frac{12}{2} [3 + 36]$$

$$= 6 \times 39$$

$$= 234$$

①8 radii of semi circles are

$0.5, 1.0, 1.5, 2.0, \dots$

lengths of semi circles are

$0.5\pi, \pi, 1.5\pi, 2\pi, \dots$

$a = 0.5\pi, d = \pi - 0.5\pi = 0.5\pi$

$n = 13$

$$S_{13} = \frac{13}{2} [2 \times 0.5\pi + 12 \times 0.5\pi]$$

$$= \frac{13}{2} [\pi + 6\pi]$$

$$= \frac{13}{2} \times 7\pi$$

$$= \frac{91}{2} \pi \text{ cm}$$

$$= \frac{91}{2} \times \frac{22}{7}$$

$$= 143 \text{ cm}$$

①9 $a = 20, d = -1, S_n = 200$

$S_n = 200$

$$\frac{n}{2} [2a + (n-1)d] = 200$$

$$\frac{n}{2} [40 + (n-1)(-1)] = 200$$

$$\Rightarrow n(40 + 1 - n) = 400$$

$$\Rightarrow n(41 - n) = 400$$

$$\Rightarrow n^2 - 41n + 400 = 0$$

$$\Rightarrow n^2 - 16n - 25n + 400 = 0$$

$$\Rightarrow n(n-16) - 25(n-16) = 0$$

$$\Rightarrow (n-16)(n-25) = 0$$

$$\Rightarrow n-16 = 0, n-25 = 0$$

$$\Rightarrow n = 16, n = 25$$

$n = 16$

$a_1 = a + 15d$

$= 20 + 15(-1)$

$= 20 - 15$

$= 5$

$a_{25} = a + 24d$

$= 20 + 24(-1)$

$= -4$

rejected

\therefore no. of rows = 16

no. of logs in top

row = 5