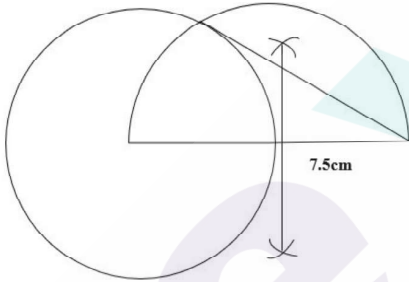
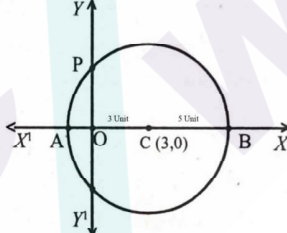
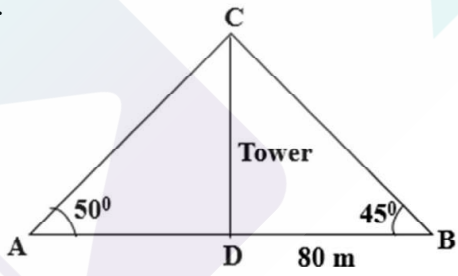
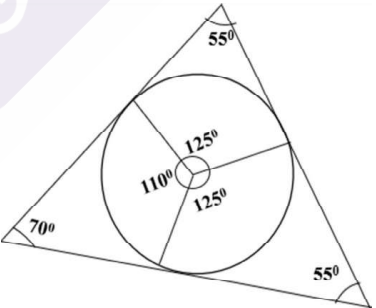


SSLC SECOND TERM EXAMINATION 2023 - 24

MATHEMATICS - ANSWERKEY

1	a. $(3, 0)$ b. Distance = 3 unit
2	a. $\angle ADC = 105^\circ$ b. $\angle ADC + \angle ABC = 180^\circ$
3	a. $PQ = \sqrt{3}$ b. $\angle QRP = 60^\circ$
4	a. Length of a base edge = $\frac{48}{8} = 6\text{cm}$ b. $a^2 = 6^2 = 36 \text{ sq.cm}$
5	
6	a. $7\sqrt{2} \text{ cm}$ b. $7\sqrt{2} \times 7\sqrt{2} = 98 \text{ sq.cm}$
7	a = 10 cm e = 13 cm a. $I = \sqrt{e^2 - \left(\frac{a}{2}\right)^2}$ $= \sqrt{13^2 - 5^2}$ $= \sqrt{169 - 25}$ $= \sqrt{144} = 12\text{cm}$ b. $2al$ $2 \times 10 \times 12 = 240 \text{ sq.cm}$
8	a. S (4, 7), Q (9, 3) b. 5

9	$3d = 12$ a. $6d = 6 \times 4 = 24$ b. $11 + 9d = 45 + 36 = 81$
10	a. $(11, 10)$ b. Point of intersection of diagonals $= \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$ $= \left(\frac{5+9}{2}, \frac{8+6}{2} \right) = (7, 7)$
11.	a. Number of white balls = 7 b. Number of black balls = 14 $\frac{14}{30} = \frac{7}{15}$ c. $\frac{6}{27} = \frac{2}{9}$
12	a. $d = 10 - 6 = 4$ b. $x_n = 4n + 2$ $2n^2 + 4n = 510$ $n = 15$
13	a. $A(-2, 0), B(8, 0)$ b. $OA \times OB = OP^2$ $OP = \sqrt{16} = 4$ Coordinates of $P = (0, 4)$ 
14	a.  b. $\triangle BDC = 45^\circ \quad 45^\circ \quad 90^\circ$ $= 1 : 1 : \sqrt{2}$ $= 80 : 80 : 80\sqrt{2}$ $= 80 \text{ m.}$ c. $\frac{CD}{BD} = \tan 50^\circ$

	$BD = \frac{CD}{\tan 50} = \frac{80}{1.19} = \frac{8000}{119} = 67.23$ Distance between the persons = $AD + BD = 80 + 67.23 = 147.23$
15	a. $\angle ABQ = 180 - 70 = 110^\circ$ b. $\angle C = \angle ABQ = 110^\circ$ $\angle A = \angle B = \frac{180 - 110}{2} = 35^\circ$
16	a. $\sqrt{20^2 - 15^2} = 25\text{m}$ b. $\pi \times 20 \times 25 = 500\pi \text{ sq.m}$ c. $500\pi \times 60 = 500 \times 3.14 \times 60 = 94200 \text{ Rs}$
17	a. $AB = \sqrt{20}$ $BC = \sqrt{5}$ $AC = \sqrt{25}$ b. Right triangle.
18	a. $360 - 100 = 260^\circ$ b. $\angle PSR = 50^\circ$, $\angle PQR = 180 - 50 = 130^\circ$ c. $\angle OSP + \angle OSR = 50^\circ$
19	Volume of the cone = $\frac{1}{3} \times \pi \times 12^2 \times 15$ Volume of the sphere = $\frac{4}{3} \times \pi \times 3^3$ $= \frac{\frac{1}{3} \times \pi \times 12^2 \times 15}{\frac{4}{3} \times \pi \times 3^3} = 20$
20	a. $\angle POQ = 180^\circ - 55^\circ = 125^\circ$ b. 

21

a. $\left(\frac{2+10}{2}, \frac{8+14}{2}\right) = (6, 11)$

b. $r = \sqrt{(6-2)^2 + (11-8)^2}$

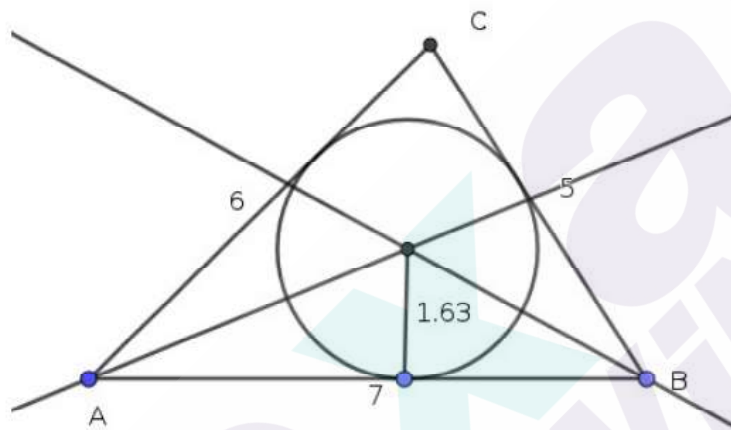
$$= \sqrt{4^2 + 3^2}$$

$$= \sqrt{25} = 5$$

c. $\sqrt{(9-6)^2 + (15-11)^2} = 5$

$\therefore$ Point (9, 15) is on the circle.

22



1. Draw $\triangle ABC$ with given measure

2. Draw the angle bisectors of $\angle A$ and $\angle B$

3. Draw a circle centering the point where the bisectors touch the sides and measure the radius

23

a. $\angle AED = 60^\circ$

b. $30^\circ \quad 60^\circ \quad 90^\circ$

$$1 : \sqrt{3} : 2$$

$$4 : 4\sqrt{3} : 8$$

$$AD = 4\sqrt{3} \text{ unit}$$

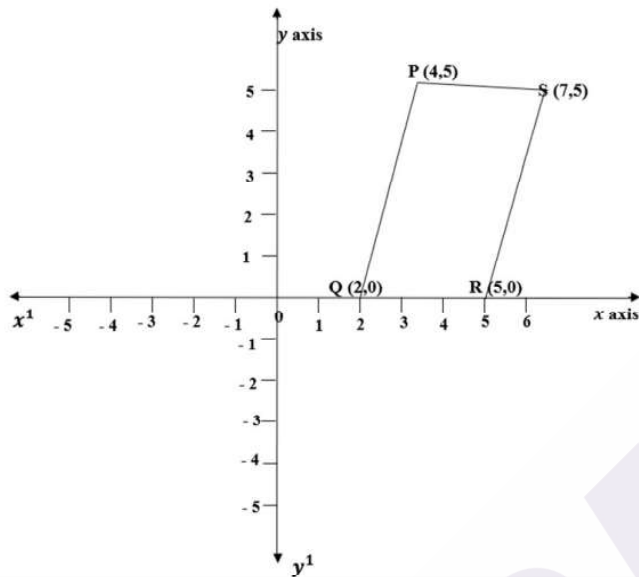
c. $DE = BE = 8\text{cm}$

d. $AB = 4 + 8 = 12\text{cm}$

$$\text{Area} = AB \times AD = 12 \times 4\sqrt{3} = 48\sqrt{3} \text{ sq. cm}$$

24

a.



b. $(4 + 5 - 2, 5 + 0 + 0) = (7, 5)$

25

a. $\angle BPQ = 110^\circ$

b. $\angle OPQ = \frac{110^\circ}{2} = 55^\circ$

$\angle OQP = \frac{120^\circ}{2} = 60^\circ$

c. $\begin{aligned} \angle POQ &= 180 - (60 + 55) \\ &= 180 - 115 \\ &= 65 \end{aligned}$

$\angle A + \angle POQ = 50 + 65$

Since the opposite angles are not supplementary, it is not cyclic.

26

a. $x_1 = 12 \quad S_3 = 51$

$x_2 = \frac{51}{3} = 17$

b. $\begin{aligned} x_8 &= x_2 + 6d \\ &= 17 + 6 \times 5 \\ &= 17 + 30 \\ &= 47 \end{aligned}$

c. $\begin{aligned} S_{15} &= x_8 \times 15 \\ &= 15 \times 47 = 705 \end{aligned}$

27	a. $h = 23 - 8 = 15 \text{ cm}$ b. $I^2 = h^2 + r^2$ $= 15^2 + 8^2 = 225 + 64$ $I = \sqrt{289} = 17 \text{ cm}$ c. Surface of the toy = Curved surface area of the hemisphere + Curved surface area of the cone. $= \pi r l + 2\pi^2$ $= \pi \times 8 \times 17 + 2 \times \pi \times 8^2$ $= 136\pi + 128\pi = 264\pi \text{ cm}^2$
28	a. $AC = 6$ b. $\left(\frac{2+8}{2}, \frac{0+0}{2}\right) = (5, 0)$ c. Height of triangle ABC = $3\sqrt{3}$ Coordinates of B = $(5, 3\sqrt{3})$ Coordinates of D = $(5, -3\sqrt{3})$
29	a. $1^3 + 2^3 + 3^3 + 4^3 + 5^3 = (1 + 2 + 3 + 4 + 5)^2 = \left(\frac{5 \times 6}{2}\right)^2$ b. $1^3 + 2^3 + 3^3 + \dots + 7^3 = (1 + 2 + 3 + \dots + x)^2 = 7$ c. $y = 9$ d. $(1 + 2 + 3 + \dots + 100)^2$ OR $\left(\frac{100 \times 101}{2}\right)^2$ e. $(1 + 2 + 3 + \dots + n)^2$ OR $\left(\frac{n(n+1)}{2}\right)^2$

