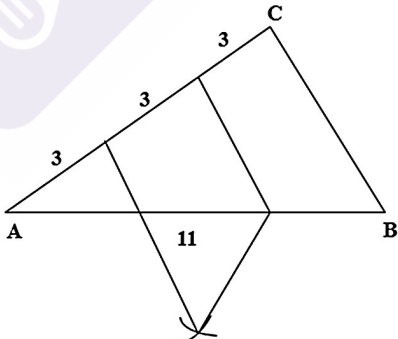


9TH SECOND TERM EXAMINATION 2023-24

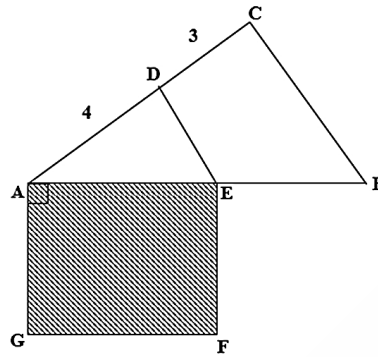
MATHEMATICS ANSWER KEY

1.	a. $AF = \frac{12}{2} = 6 \text{ cm}$ b. $EF: BC = 1 : 2$
2.	a. $PQ = 3 \times AB = 15$ b. Perimeter of ΔABC : Perimeter of ΔPQR $[11 : 33]$ $1 : 3$
3.	a. $x^2 + 2$ b. $p(x) = 2x + 1$ $p(1) = 2 \times 1 + 1$ $= 2 + 1$ $= 3$
4.	a. $BC = \sqrt{3^2 - 1^2}$ $= \sqrt{9 - 1}$ $= \sqrt{8} = 2\sqrt{2}$ b. Perimeter of $\Delta ABC = 1 + 3 + 2\sqrt{2}$ $= 4 + 2\sqrt{2} \text{ cm}$
5.	a) $\angle AOC = 60$ b) $\angle OC = 2 \text{ cm}$ c) $AB = 2 \times AC$ $= 2 \times 2\sqrt{3}$ $= 4\sqrt{3} \text{ cm}$
6.	

7.	<p>a. B</p> <p>b. Area of regular Hexagon = $6\sqrt{3} \times \frac{2^2}{4} = 6\sqrt{3} \text{ cm}^2$</p>
8.	<p>a. $\angle AED = 50^\circ$</p> <p>b. $\angle C = 50^\circ$</p> <p>c. $\frac{BC}{DE} = \frac{12}{4} = 3$</p>
9.	<p>a. $0.333\dots = \frac{3}{9}$</p> <p>b. $\sqrt{0.444\dots} \times \sqrt{0.1111\dots}$</p> $= \sqrt{\frac{4}{9}} \times \sqrt{\frac{1}{9}}$ $= \frac{2}{3} \times \frac{1}{3}$ $= \frac{2}{9}$ $= 0.222 \dots$
10.	<p>a. $BD = 4 \text{ cm}$</p> <p>b. Area of $\Delta ABC = 12 \text{ cm}^2$ Area of $\Delta BDC = 8 \text{ cm}^2$ Area of $\Delta ADC = \text{Area of } \Delta BDC + \text{Area of } \Delta ABC$ $= 8 + 12$ $= 20 \text{ cm}^2$</p>
11.	<p>a. $AP = \frac{16}{2} = 8 \text{ cm}$</p> <p>b. $CQ = \frac{30}{2} = 15 \text{ cm}$</p> $OQ = \sqrt{17^2 - 15^2}$ $= \sqrt{289 - 225}$ $= 8 \text{ cm}$ <p>c. $OP = \sqrt{17^2 - 8^2}$</p> $= \sqrt{289 - 64}$ $= \sqrt{225}$ $= 15$ <p>Distance between chords = $15 + 8 = 23 \text{ cm}$</p>

12. Perimeter = $2(i + b) = 18 \text{ cm}$

$$i + b = \frac{18}{2} = 9 \text{ cm}$$



13. $p(x) = ax + b$

a. $p(1) = 2$

$$p(1) = 2$$

$$p(1) = a \times 1 + b = 2$$

$$a + b = 2$$

$p(2) = 5$

$$p(2) = a \times 2 + b = 5$$

$$2a + b = 5$$

b. $2a + b = 5$

$$a + b = 2$$

$$b = -1$$

$$\therefore a = 3 \text{ \& } b = -1$$

14. a. $BD = \sqrt{5^2 - 4^2}$

$$= \sqrt{25 - 16}$$

$$= \sqrt{9}$$

$$= 3$$

b. Perimeter of $\Delta ABC = AB + AC + BC$

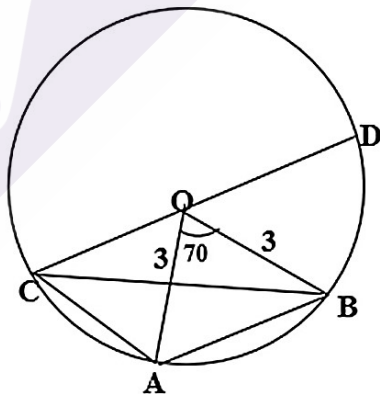
$$= 5 + 5 + 6$$

$$= 16 \text{ cm}$$

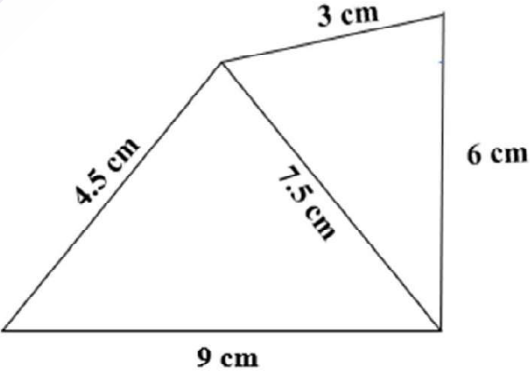
c. Perimeter = 2×16

$$= 32 \text{ cm}$$

15. To draw a line through O parallel to AB



16	<p>a) $x - y = 6$ $x^2 - y^2 = 48$</p> <p>b) $(x + y)(x - y) = x^2 - y^2$ $(x + y) \times 6 = 48$ $x + y = \frac{48}{6}$ $x + y = 8$</p> <p>c) $x + y$ $x - y$ $2x = 14$ $x = \frac{14}{2} = 7$ $x + y = 8$ $7 + y = 8$ $y = 8 - 7 = 1$ $\therefore x = 7 \text{ \& } y = 1$</p>
17	<p>a. $AM = \frac{24}{2} = 12 \text{ cm}$</p> <p>b. $OM = r - 8$</p> <p>c. $r^2 = 12^2 + (r - 8)^2$ $r^2 = 144 + r^2 - 16r + 64$ $r^2 - r^2 + 16r = 144 + 64$ $16r = 208$ $r = \frac{208}{16}$ $r = 13$</p>
18	<p>a. $AC = \sqrt{20^2 - 12^2} = 16 \text{ cm}$</p> <p>b. $AN = CN = \frac{16}{2} = 8 \text{ cm}$ $AM = BM = \frac{20}{2} = 10 \text{ cm}$ $MN = \frac{BC}{2} = 6 \text{ cm}$ Perimeter of small triangles = $6 + 8 + 10 = 24 \text{ cm}$</p>

19	<p>a) $PA = 6 - 4 = 2\text{ cm}$</p> <p>b) $OB : OQ = 4 : 6 = 2 : 3$</p> <p>c) $\triangle AOB$ and $\triangle POQ$ are similar triangles</p> $PQ = 3 \times \frac{3}{2} = 4.5\text{ cm}$
20	<p>a) breadth = x length = $x + 2$</p> <p>b) Perimeter = $2(l + b)$ $P(x) = 2(x + 2 + x)$ $P(x) = 2(2x + 2)$ $P(x) = 4x + 4$</p> <p>c) Area = $l \times b$ $a(x) = (x + 2) x$ $a(x) = x^2 + 2x$</p>
21	<p>a. diameter = $4\sqrt{2}\text{ cm}$ radius = $2\sqrt{2}\text{ cm}$</p> <p>b. Area = πr^2 $= \pi (2\sqrt{2})^2$ $= \pi \times 4 \times 2$ $= 8\pi\text{cm}^2$</p> <p>c. $45^\circ, 45^\circ, 90^\circ$ $1 : 1 : \sqrt{2}$ $8 : 8 : 8\sqrt{2}$ Side = 8 Area = Side² $= 8^2 = 64$</p>
22	$1 + \frac{1}{2} = \frac{3}{2}$ $6 \times \frac{3}{2} = 9$ 

23	<p>a. $\angle ACD = 30^\circ$</p> <p>b. $CD = \sqrt{3}$</p> <p>c. Perimeter of $\triangle ABC = AC + BC + AB$</p> $= 2 + 1 + \sqrt{3} + \sqrt{6}$ $= 3 + \sqrt{3} + \sqrt{6}$
24	<p>a. Perimeter = 60</p> $2(1 + b) = 60$ $1 + b = 30$ <p>b. $1 = x$</p> $b = 30 - x$ $a(x) = x(30 - x)$ <p>c. $a(25) = 25(30 - 25)$</p> $= 25 \times 5$ $= 125$ $a(5) = 5(30 - 5)$ $= 5 \times 25 = 125$
25	<p>a. $R + r = 12$</p> <p>b. Area of sector OAB = $\pi R^2 x \frac{45}{360}$</p> $= \frac{\pi R^2}{8} \text{ cm}^2$ <p>Area of sector OCD = $\pi r^2 x \frac{1}{8}$</p> <p>Area of shaded = 12π</p> $= \frac{\pi R^2}{8} - \frac{\pi r^2}{8} = 12\pi$ $= \frac{\pi}{8} (R^2 - r^2) = 12\pi$ $(R^2 - r^2) = 12 \times 8$ $(R + r)(R - r) = 12 \times 8$ $12(R - r) = 12 \times 8$ $R - r = 8$ $\begin{array}{r} R + r = 12 \\ R - r = 8 \\ \hline 2R = 20 \end{array}$

	$R = 10\text{cm}$ $R + r = 12$ $r = 12 - 10 = 2\text{cm}$
26	
27	<p>a. $AQ : QC = AP : PD = 12 : 4 = 3 : 1$</p> <p>b. $AR : BR = AP : PD = 3 : 1$ $AR = 3 \times BR = 9 \text{ cm.}$ $AB = 9 + 3 = 12 \text{ cm}$</p> <p>c. Perimeter $= AR + RQ + PQ + PA$ $= 9 + 12 + 9 + 12$ $= 42 \text{ cm}$</p>
28	<p>a. Area of Square $= a^2 = 4^2 = 16 \text{ cm}^2$</p> <p>b. $r = 2$ Perimeter of outerpart $= 4 \times \text{Arc}$ $= 4 \times \frac{270}{360} \times \pi \times 2$ $= 4 \times \frac{27}{9} \times \pi$ $= 4 \times 3 \pi$ $= 12\pi$</p> <p>c. $r = 2$ Area of one sector $= \frac{270}{360} \times \pi \times 2^2$ Area of shaded part $= 4 \times 3 \pi$ $= 12\pi \text{ cm}^2$ Or $3\pi r^2$ $3\pi \times 2^2 = 12\pi$</p>

29	a. $\frac{1}{16} + \frac{1}{3^2} = \frac{3}{3^2} = \frac{2}{2^5}$ b. $\frac{3}{64}$ c. $\frac{3}{2^7}$ d. $\frac{3}{2^{11}}$ e. $\frac{3}{2^{n+1}}$
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