

REG-POC-2324-ASM-SET 1-MATH**Suggested solutions****Multiple Choice Questions**

1. B	2. C	3. A	4. A	5. C
6. C	7. B	8. A	9. A	10. C
11. B	12. B	13. A	14. C	15. B
16. A	17. A	18. C	19. A	20. B
21. B	22. D	23. B	24. D	25. D
26. D	27. A	28. B	29. D	30. C

1. B

$$OS \perp XY \text{ and } OX = OH = 10 \text{ cm}$$

$$OS = \sqrt{10^2 - 8^2}$$

$$= 6 \text{ cm}$$

2. C

Let O be the centre of the circle.

Let the radius be r cm.

$$OM = (r - 8) \text{ cm}$$

$$AM = \frac{32}{2} = 16 \text{ cm}$$

$$r^2 = (r - 8)^2 + 16^2$$

$$r^2 = r^2 - 16r + 320$$

$$r = 20$$

3. A

$$CD = \frac{14}{2} = 7 \text{ cm}$$

$$OC = \sqrt{20^2 - 7^2}$$

$$= \sqrt{351} \text{ cm}$$

$$\text{Required radius} = \sqrt{(\sqrt{351})^2 + (7 + 8)^2}$$

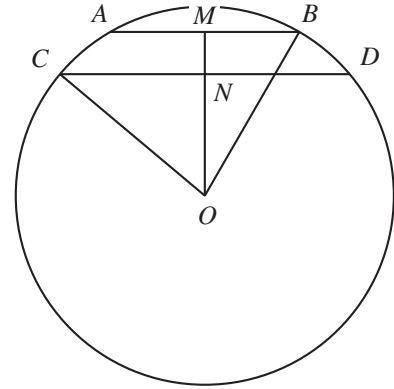
$$= 24 \text{ cm}$$

4. A

Let O be the centre of the circle.

Let M and N be mid-points of AB and CD respectively.

$$\begin{aligned}
 BM &= \frac{14}{2} = 7 \text{ cm} \\
 OM &= \sqrt{25^2 - 7^2} \\
 &= 24 \text{ cm} \\
 MN &= 24 - 9 = 15 \text{ cm} \\
 CN &= \sqrt{25^2 - 15^2} \\
 &= 20 \text{ cm} \\
 CD &= 2(20) = 40 \text{ cm}
 \end{aligned}$$



5. C

Let M be the mid-point of AB .

$$\begin{aligned}
 AM &= BM = \frac{30}{2} = 15 \text{ cm} \\
 OM &= \sqrt{25^2 - 15^2} \\
 &= 20 \text{ cm} \\
 OD &= 25 + 27 = 52 \text{ cm} \\
 BM &= \sqrt{52^2 - 20^2} \\
 &= 48 \text{ cm} \\
 BD &= 48 - 15 = 33 \text{ cm}
 \end{aligned}$$

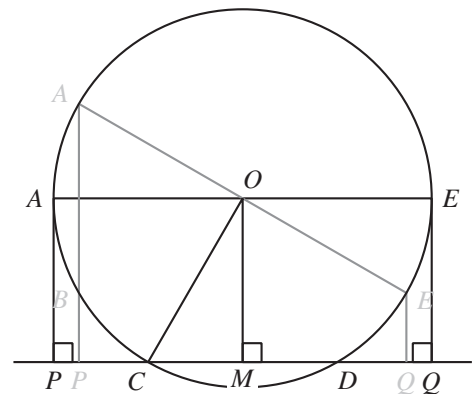
6. C

Let O be the centre and M be mid-point of CD .

Rotate AE such that $AE \parallel CD$.

We have $AP = EQ = OM$.

$$\begin{aligned}
 CM &= \frac{16}{2} = 8 \text{ cm} \\
 OC &= \frac{34}{2} = 17 \text{ cm} \\
 OM &= \sqrt{17^2 - 8^2} \\
 &= 15 \text{ cm} \\
 AP + EQ &= 15 + 15 \\
 &= 30 \text{ cm}
 \end{aligned}$$



7. B

$$AP = \frac{24}{2} = 12 \text{ cm}$$

$$OP \perp AB$$

$$\begin{aligned} \text{Radius} &= \sqrt{12^2 + 5^2} \\ &= 13 \text{ cm} \end{aligned}$$

8. A

Let M be mid-point of CD such that $OM \perp CD$.

$$CM = \frac{5 + 13}{2} = 9 \text{ cm}$$

$$OQ = PM = 9 - 5 = 4 \text{ cm}$$

9. A

Let M be the mid-point of CD .

$$CM = \frac{24}{2} = 12 \text{ cm}$$

$$OA = \frac{26}{2} = 13 \text{ cm}$$

$$\begin{aligned} OM &= \sqrt{13^2 - 12^2} \\ &= 5 \text{ cm} \end{aligned}$$

Required distance is 5 cm.

10. C

$$\begin{aligned} BD &= \sqrt{10^2 - 6^2} \\ &= 8 \text{ cm} \end{aligned}$$

$$\cos \angle AOD = \frac{6}{10}$$

$$\angle AOD \approx 53.1^\circ$$

$$\angle AOB = 2\angle AOD$$

$$\approx 106^\circ$$

$$\begin{aligned} \text{Required area} &= \frac{(3)(8)}{2} + 10^2 \pi \left(\frac{\angle AOB}{360^\circ} \right) - 2 \times \frac{(6)(10)}{2} \\ &\approx 57 \text{ cm}^2 \end{aligned}$$

11. B

$$MB = \frac{AB}{2} = 5 \text{ cm}$$

$$BN = \frac{BC}{2} = 8 \text{ cm}$$

$$\begin{aligned} \text{Required area} &= (8)(5) \\ &= 40 \text{ cm}^2 \end{aligned}$$

12. B

$$OD = \frac{AB}{2} = 6 \text{ cm and } DM = \frac{DC}{2} = 5 \text{ cm}$$

$$OM = \sqrt{OD^2 - DM^2} = \sqrt{6^2 - 5^2} = \sqrt{11} \text{ cm}$$

13. A

$$\begin{aligned} OA &= OC = 15 \text{ cm} \\ OM &= \sqrt{15^2 - 12^2} = 9 \text{ cm} \\ MC &= 15 - 9 = 6 \text{ cm} \end{aligned}$$

14. C

$$\begin{aligned} PQ &= PM + MQ = 18 \text{ cm} \\ OR &= \frac{PQ}{2} = 9 \text{ cm} \\ OM &= 9 - 4 = 5 \text{ cm} \\ RM &= \sqrt{9^2 - 5^2} = \sqrt{56} \text{ cm} \end{aligned}$$

15. B

Let M and N be mid-points of AB and CD respectively.

$$AM = \frac{AB}{2} = 6 \text{ and } OM^2 = 7^2 - AM^2 = 13.$$

$$CN = \frac{CD}{2} = 5 \text{ and } ON^2 = 7^2 - CN^2 = 24.$$

$$OK = \sqrt{OM^2 + ON^2} = \sqrt{37}.$$

16. A

Let $OA = r$ cm.

$$\angle OMA = 90^\circ$$

Consider $\triangle OAM$.

$$r^2 = (r - 2)^2 + 3^2$$

$$r^2 = r^2 - 4r + 13$$

$$r = 3.25$$

$$OM = r - 2 = 1.25 \text{ cm}$$

17. A

Let M be the mid-point of AC . Then $OM \perp AC$. Consider the area of $\triangle OAB$,

$$\frac{(AB)(OM)}{2} = \frac{(OB)(OA)}{2}$$

$$\frac{\sqrt{3^2 + 4^2}(OM)}{2} = 6$$

$$OM = 2.4$$

$$AM = \sqrt{OA^2 - OM^2} = 3.2 \text{ and } BM = \sqrt{OB^2 - OM^2} = 1.8.$$

$$BC = CM - BM = AM - BM = 1.4.$$

18. C

Let M be the mid-point of AB . Required distance is OM .

$$AM = \frac{AB}{2} = 10 \text{ and } OM = \sqrt{OA^2 - AM^2} = 24.$$

19. A

$$OM \perp BC \text{ and } OM = \sqrt{OC^2 - MC^2} = 8.$$

$$AM = \sqrt{OA^2 - OM^2} = 4\sqrt{5} \text{ and } AD = 2AM = 8\sqrt{5}.$$

20. B

Let G be the foot of perpendicular of B on OC .

$$AE = \frac{9 + 39}{2} = 24 \text{ cm.}$$

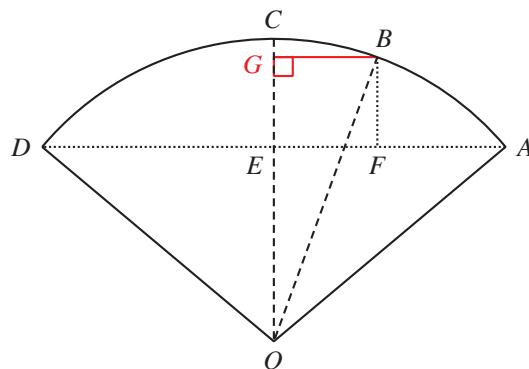
$$\text{Radius} = \sqrt{24^2 + 18^2} = 30 \text{ cm.}$$

$$BG = EF = 24 - 9 = 15 \text{ cm.}$$

$$\sin \angle BOG = \frac{15}{30}$$

$$\angle BOG = 30^\circ$$

$$\text{Required area} = (30)^2 \pi \times \frac{30^\circ}{360^\circ} = 75\pi \text{ cm}^2.$$



21. B

$$AM = AN \text{ and } MN = 2(2) = 4 \text{ cm}$$

$$HK = MN = 4 \text{ cm}$$

22. D

Let O be the centre of the circle.

$$\angle BMO = \angle CNO = 90^\circ$$

$$\angle BMN = 90^\circ - 82^\circ = 8^\circ$$

$$\angle BNM = \angle BMN = 8^\circ$$

$$\angle DNM = 90^\circ + 8^\circ = 98^\circ$$

23. B

$$AB \perp OP, CD \perp OQ \text{ and } OP = OQ = \frac{16}{2} = 8 \text{ cm.}$$

$$AP = \sqrt{17^2 - 8^2}$$

$$= 15 \text{ cm}$$

$$AB = 2(15) = 30 \text{ cm}$$

24. D

Let O be the centre of the circle.

$$OM \perp AB, ON \perp CD \text{ and } OM = ON.$$

$$\angle OMN = 100^\circ - 90^\circ = 10^\circ$$

$$\angle ONM = \angle OMN = 10^\circ$$

$$\angle CNM = 90^\circ + 10^\circ = 100^\circ$$

25. D

$$\angle ABC = 360^\circ - 90^\circ \times 2 - 110^\circ = 70^\circ.$$

$OM = ON$, $OM \perp AB$, $ON \perp BC$. So, $AB = BC$.

$$\angle BAC = \frac{180^\circ - 70^\circ}{2} = 55^\circ.$$

26. D

$OM \perp AB$, $ON \perp BC$ and $AB = BC$. So, $OM = ON$.

$$\angle MON = 360^\circ - 90^\circ \times 2 - 68^\circ = 112^\circ.$$

$$\angle OMN = \frac{180^\circ - 112^\circ}{2} = 34^\circ.$$

27. A

Let M , N and T be mid-points of AB , CD and EF respectively such that $OM \perp AB$, $ON \perp CD$ and $OT \perp EF$.

$OM = ON = OT$.

$\triangle OTR \cong \triangle ONR$ and $\triangle ONQ \cong \triangle OMQ$.

Let $\angle ORN = a$ and $\angle OQN = b$.

Then $\angle ORT = a$ and $\angle OQM = b$.

In $\triangle PQR$,

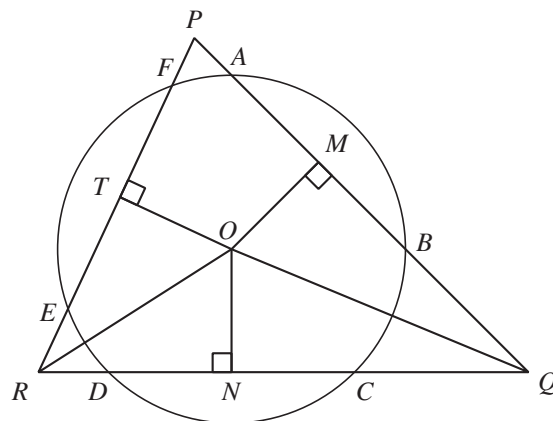
$$2a + 2b + 38^\circ = 180^\circ$$

$$a + b = 71^\circ$$

In $\triangle QOR$,

$$a + b + \angle QOR = 180^\circ$$

$$\angle QOR = 109^\circ$$



28. B

Let D , E and F be mid-points of PQ , RS and TU respectively.

$\triangle BOD \cong \triangle BOE$ and $\triangle COF \cong \triangle COE$.

Let $\angle OBD = a$ and $\angle OCE = b$.

Then $\angle OBE = a$ and $\angle OCF = b$.

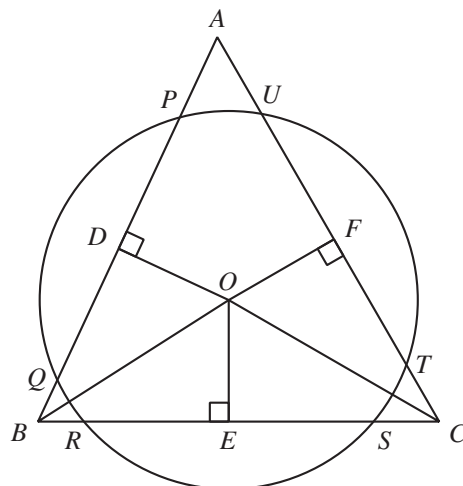
$$\angle BOC + a + b = 180^\circ$$

$$a + b = 72^\circ$$

$$\angle BAC = 180^\circ - 2a - 2b$$

$$= 180^\circ - 2(72^\circ)$$

$$= 36^\circ$$



29. D

Since $AD = BQ = CQ$, the distances from three chords to centre are equal.

Note that $\triangle OYP \cong \triangle OZP$ and $\triangle OYR \cong \triangle OXR$.

Let $\angle YPO = \angle ZPO = a$ and $\angle YRO = \angle XRO = b$. In $\triangle POR$,

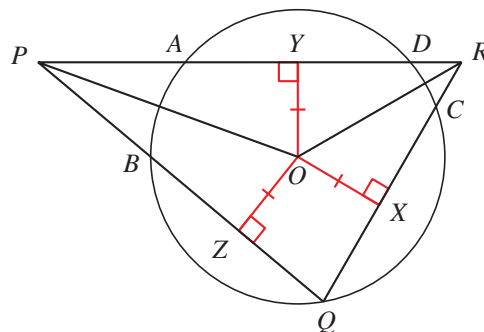
$$130^\circ + a + b = 180^\circ$$

$$a + b = 50^\circ$$

In $\triangle PQR$,

$$\angle PQR + 2(a + b) = 180^\circ$$

$$\angle PQR = 80^\circ$$



30. C

Let W, X, Y and Z be mid-points of AB, CD, EF and GH respectively.

$\triangle PWO \cong \triangle PZO, \triangle QWO \cong \triangle QXO$.

$\triangle RXO \cong \triangle RYO, \triangle SYO \cong \triangle SZO$.

$\angle XOZ = 2 \times \angle POQ = 172^\circ$.

$$\angle ROS = \frac{1}{2}(\text{reflex } \angle XOZ) = \frac{360^\circ - 172^\circ}{2} = 94^\circ.$$

