

REG-POC-2425-ASM-SET 2-MATH**Suggested solutions****Multiple Choice Questions**

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

1. B

$$\begin{aligned}\angle CAB &= \frac{1}{2}\angle BOC = 82^\circ \\ \angle OAB &= \angle ABO = 36^\circ \\ \angle ACO &= \angle CAO = 82^\circ - 36^\circ = 46^\circ\end{aligned}$$

2. C

$$\begin{aligned}\text{Reflex } \angle AOC &= 360^\circ - (x + 18^\circ) = 342^\circ - x \\ 342^\circ - x &= 2(5x + 6^\circ) \\ x &= 30^\circ\end{aligned}$$

3. D

$$\begin{aligned}\angle BCD &= 180^\circ - 118^\circ = 62^\circ \text{ and } \angle EDC = \angle BCD = 62^\circ. \\ \angle DEB &= \frac{\angle BCD}{2} = 31^\circ. \\ \angle DFE &= 180^\circ - 31^\circ - 62^\circ = 87^\circ.\end{aligned}$$

4. B

$$\begin{aligned}\text{Let } \angle ABC &= x. \\ \text{Reflex } \angle AOC &= 2x \text{ and } \angle AOC = 360^\circ - 2x. \\ (360^\circ - 2x) + 58^\circ + x + 56^\circ &= 360^\circ \\ x &= 114^\circ\end{aligned}$$

5. D

$$\begin{aligned}\angle AOB &= 2\angle AEB = 80^\circ \\ \angle ADC &= \frac{1}{2}(\angle AOB + \angle BOC) = 95^\circ\end{aligned}$$

6. C

$$\angle ACB = 90^\circ$$

$$\angle AC = \sqrt{(2 \times 26)^2 - 20^2} = 48 \text{ cm}$$

$$\text{Required area} = (20)(48)$$

$$= 960 \text{ cm}^2$$

7. B

$$\text{Let } \angle PRM = x.$$

$$\text{Since } ON = NR, \text{ we have } \angle NOR = x.$$

$$\angle QMR = \frac{\angle NOR}{2} = \frac{x}{2}$$

$$\text{In } \triangle MQR,$$

$$x + \frac{x}{2} = 36^\circ$$

$$x = 24^\circ$$

8. A

$$\text{Let } \angle ODC = x.$$

$$\angle BOA = 180^\circ - 2 \times 66^\circ = 48^\circ.$$

$$\angle COD = \angle ODC = x \text{ and } \angle OBC = \angle OCB = \angle COD + \angle CDO = 2x.$$

$$\angle BOA = \angle OBD + \angle ODB$$

$$48^\circ = 2x + x$$

$$x = 16^\circ$$

9. B

$$\text{Let } \angle BEA = x.$$

$$\angle ABD = 90^\circ$$

$$\angle COD = \angle CEO = x$$

$$\angle CBD = \frac{1}{2} \angle COD = \frac{x}{2}$$

$$66^\circ + \left(90^\circ + \frac{x}{2}\right) + x = 180^\circ$$

$$x = 16^\circ$$

10. A

$$\text{Note that } \angle ACB = 90^\circ \text{ and } AB \text{ is a diameter of the circle.}$$

$$\text{Required area} = \frac{1}{2} \times \left(\frac{25}{2}\right)^2 \pi - \frac{(7)(24)}{2}$$

$$\approx 161 \text{ cm}^2$$

11. C

$$\angle QPS = 90^\circ$$

$$\angle QPR = 28^\circ + 32^\circ = 60^\circ$$

$$\angle RPS = 90^\circ - 60^\circ = 30^\circ$$

12. D

$$\begin{aligned}\angle CAB &= \angle CDB = \angle DBA = \angle DCA = 20^\circ \text{ and } \angle ACB = 90^\circ. \\ \angle CBD &= 180^\circ - 20^\circ - 90^\circ - 20^\circ = 50^\circ.\end{aligned}$$

13. A

$$\angle CAD = \angle CBD = 45^\circ$$

14. C

$$\text{Let } \angle ABD = x.$$

$$AB = AD \text{ and } \angle ADB = \angle ABD = x.$$

$$\angle ACB = \angle ADB = x \text{ and } \angle DAC = \angle ACB = x.$$

$$\text{In } \triangle ADE,$$

$$x + x = 74^\circ$$

$$x = 37^\circ$$

$$\text{In } \triangle ABD,$$

$$x + x + (x + \angle BAE) = 180^\circ$$

$$\angle BAE = 69^\circ$$

15. C

$$\angle BDC = \angle ABD = 32^\circ$$

$$\angle DCB = \frac{180^\circ - 32^\circ}{2} = 74^\circ$$

$$\angle ACD = \angle ABD = 32^\circ$$

$$\angle ACB = 74^\circ - 32^\circ = 42^\circ$$

16. A

$$\text{Let } \angle BCD = x.$$

$$\angle BAD = \angle BCD = x$$

$$\angle BAD = \angle BDA = x$$

$$\angle ADC = \angle BAD = x$$

$$\angle CBD = 90^\circ$$

$$x + (x + x) + 90^\circ = 180^\circ$$

$$x = 30^\circ$$

17. D

$$\angle ADC = 90^\circ. \angle ADE = 90^\circ - 48^\circ = 42^\circ.$$

$$\angle BCE = \angle ADE = 42^\circ \text{ and } \angle BEC = 180^\circ - 42^\circ - 56^\circ = 82^\circ.$$

18. C

Let $\angle ABD = x$.

$$\angle ADB = \angle ABD = x$$

$$\angle BAC = \angle BDC = \angle ABD = x$$

$$x + (x + 66^\circ) + x = 180^\circ$$

$$x = 38^\circ$$

$$\angle BEC = x + x = 76^\circ$$

19. D

$$\angle DCK = 90^\circ - 32^\circ = 58^\circ.$$

$$\angle ABK = \angle DCK = 58^\circ \text{ and } \angle AKB = \angle ABK = 58^\circ.$$

$$\angle KDC = \angle BAK = 180^\circ - 58^\circ - 58^\circ = 64^\circ.$$

20. C

$$\angle CAB = \angle CDB \text{ and } \angle ABD = \angle CDB$$

We have $\angle CAB = \angle ABD$.

$$\angle AFB = \angle DFC = 50^\circ$$

$$\angle FAB = \frac{180^\circ - 50^\circ}{2} = 65^\circ$$

$$\angle EAC = \angle DFC = 50^\circ$$

$$\angle BAE + 50^\circ + 65^\circ = 115^\circ$$

21. C

$$\angle ABE = 90^\circ \text{ and } \angle AEB = \angle ACB = 30^\circ$$

$$\angle EAB = 180^\circ - 90^\circ - 30^\circ = 60^\circ$$

22. C

AC is a diameter of the circle and $AC = \sqrt{10^2 + 5^2} \approx 11.2$ cm.

$$\angle DAC = \angle DEC = 40^\circ \text{ and } \angle ADC = 90^\circ.$$

$$CD = AC \sin 40^\circ \approx 7 \text{ cm.}$$

23. C

$$\angle ACD = \angle ABC + \angle BAC = a + b$$

$$\angle AFD = \angle ACD = a + b$$

$$\angle CEF = \angle FAE + \angle AFE$$

$$= (a + b) + a$$

$$= 2a + b$$

24. B

$$\angle CAD = 90^\circ \text{ and } \angle BAC = 116^\circ - 90^\circ = 26^\circ$$

$$\angle AEF = 78^\circ - 26^\circ = 52^\circ$$

$$\angle ACD = \angle AEF = 52^\circ$$

$$\angle ABD = 52^\circ - 26^\circ = 26^\circ$$

25. B

Let $\angle ABX = x$.

$$\angle AXB = 90^\circ$$

$$\angle AYX = \angle ABX = x$$

$$\angle YAZ = \angle AYX - \angle YZA = x - 23^\circ$$

$$x + 90^\circ + (35^\circ + (x - 23^\circ)) = 180^\circ$$

$$x = 39^\circ$$

26. B

$$\angle ACB = \angle QCB = 90^\circ$$

$$\angle BPC = \angle BAC = 30^\circ$$

$$\angle ACP = \angle QPC + \angle CQP = 55^\circ$$

$$\angle PCB = 90^\circ - 55^\circ = 35^\circ$$

27. C

$$\angle ACE = 34^\circ - 20^\circ = 14^\circ$$

$$\angle ABD = \angle ACE = 14^\circ$$

$$\angle ADB = x + 46^\circ$$

$$\angle ACB = \angle ADB = x + 46^\circ$$

Consider $\triangle ABC$.

$$(x + 14^\circ) + 34^\circ + (x + 46^\circ) = 180^\circ$$

$$x = 43^\circ$$

28. D

$$\angle AEB = 90^\circ$$

$$\angle BAD = 180^\circ - 90^\circ - 42^\circ - 36^\circ = 12^\circ$$

$$\angle BED = \angle BAD = 12^\circ$$

$$x = 36^\circ - 12^\circ = 24^\circ$$

29. B

$$\angle CDB = x \text{ and } \angle DBE = x - 35^\circ.$$

$$(x - 35^\circ) + x = 81^\circ$$

$$x = 58^\circ$$

30. B

Let O be the centre of the circle, and N be the mid-point of AB such that $ON \perp AB$.

$$\triangle AMD \sim \triangle CMB$$

$$\frac{AM}{MD} = \frac{CM}{MB}$$

$$CM = 4$$

$$NB = \frac{2+6}{2} = 4 \text{ and } ON = 4 - \frac{4+3}{2} = 0.5$$

$$\text{Radius} = \sqrt{4^2 + 0.5^2} \approx 4.03$$

