

REV-POC-2324-ASM-SET 1-MATH

Suggested solutions

Multiple Choice Questions

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

1. C

Let O be the centre of the circle.

Let the radius be r cm.

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

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

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

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

$$r = 20$$

2. A

Let O be the centre of the circle.

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

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

$$OM = \sqrt{25^2 - 7^2}$$

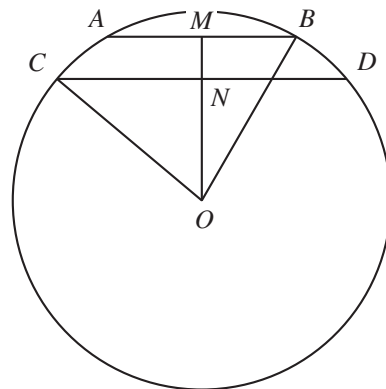
$$= 24 \text{ cm}$$

$$MN = 24 - 9 = 15 \text{ cm}$$

$$CN = \sqrt{25^2 - 15^2}$$

$$= 20 \text{ cm}$$

$$CD = 2(20) = 40 \text{ cm}$$



3. C

Let M be the mid-point of AB .

$$AM = BM = \frac{30}{2} = 15 \text{ cm}$$

$$OM = \sqrt{25^2 - 15^2}$$

$$= 20 \text{ cm}$$

$$OD = 25 + 27 = 52 \text{ cm}$$

$$BM = \sqrt{52^2 - 20^2}$$

$$= 48 \text{ cm}$$

$$BD = 48 - 15 = 33 \text{ cm}$$

4. A

Let M be the mid-point of CD .

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

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

$$OM = \sqrt{13^2 - 12^2}$$

$$= 5 \text{ cm}$$

Required distance is 5 cm.

5. A

$$OA = OC = 15 \text{ cm}$$

$$OM = \sqrt{15^2 - 12^2} = 9 \text{ cm}$$

$$MC = 15 - 9 = 6 \text{ cm}$$

6. A

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

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

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

$$OM = 2.4$$

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

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

7. A

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

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

8. B

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

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

9. D

Let O be the centre of the circle.

$OM \perp AB$, $ON \perp CD$ and $OM = ON$.

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

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

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

10. D

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

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

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

11. C

$$\text{Reflex } \angle AOC = 360^\circ - (x + 18^\circ) = 342^\circ - x$$

$$342^\circ - x = 2(5x + 6^\circ)$$

$$x = 30^\circ$$

12. D

$$\angle BCD = 180^\circ - 118^\circ = 62^\circ \text{ and } \angle EDC = \angle BCD = 62^\circ.$$

$$\angle DEB = \frac{\angle BCD}{2} = 31^\circ.$$

$$\angle DFE = 180^\circ - 31^\circ - 62^\circ = 87^\circ.$$

13. B

Let $\angle ABC = x$.

Reflex $\angle AOC = 2x$ and $\angle AOC = 360^\circ - 2x$.

$$(360^\circ - 2x) + 58^\circ + x + 56^\circ = 360^\circ$$

$$x = 114^\circ$$

14. D

$$\angle AOB = 2\angle AEB = 80^\circ$$

$$\angle ADC = \frac{1}{2}(\angle AOB + \angle BOC) = 95^\circ$$

15. A

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

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

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

16. C

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

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

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

17. D

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

18. A

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

19. A

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

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

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

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

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

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

$$x = 30^\circ$$

20. D

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

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

21. C

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

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

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

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

$$x = 38^\circ$$

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

22. D

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

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

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

23. C

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

$$\text{We have } \angle CAB = \angle ABD.$$

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

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

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

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

24. C

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

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

25. C

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

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

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

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

$$= 2a + b$$

26. B

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

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

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

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

27. B

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

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

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

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

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

$$x = 39^\circ$$

28. B

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

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

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

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

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 $ON \perp AB$.

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

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

$$CM = 4$$

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

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

