

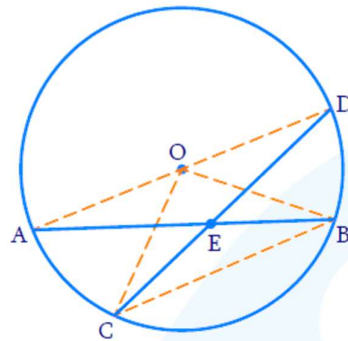
Circles

Review Exercise Questions

Level-1

Single Choice Correct Only

- Q1.** In a circle with center O , chords AB and CD intersect at E :

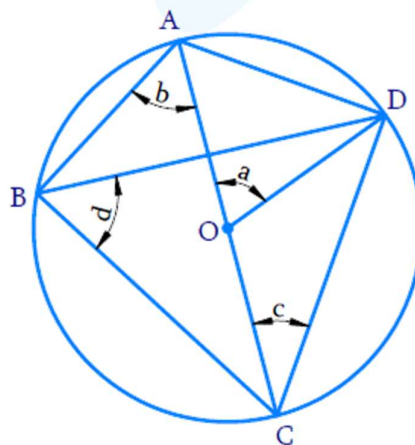


Which of the following is correct?

- (A) $\angle AEC = |\angle BOD - \angle AOC|$
- (B) $\angle AEC + \angle BOC = \angle AOC + \angle BOD$
- (C) $\angle AOC + \angle BOD = 2\angle AEC$
- (D) None of these

Multiple Options may be Correct

- Q2.** Consider the following figure.



O is the center of the circle. Which of the following are correct?

(A) A. $\angle b = 90^\circ - \frac{1}{2} \angle a$

(B) B. $\angle c = \frac{1}{2} \angle a$

(C) C. $\angle d = 90^\circ - \frac{1}{2} \angle a$

(D) D. $\angle b + \angle c = 90^\circ$

Q3. I is the incenter of $\triangle ABC$. AI when produced meets the circum circle of $\triangle ABC$ in D. If $\angle BAC = 48^\circ$ and $\angle ACB = 68^\circ$, which of the following are correct?

(A) $\angle DBC = 24^\circ$

(B) $\angle IBC = 32^\circ$

(C) $\angle ADB = 68^\circ$

(D) $\angle BID = 56^\circ$

Q4. ABCD is a cyclic quadrilateral such that AB is a diameter of the circumscribing circle, and $CD \parallel AB$. Also $\angle CAB = 30^\circ$. Which of the following are correct?

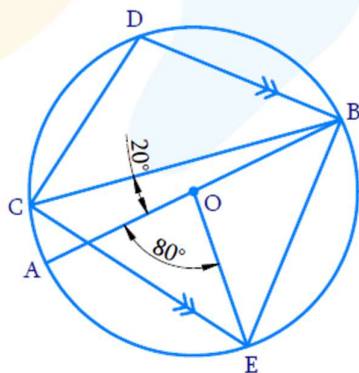
(A) $\angle ACB = 80^\circ$

(B) $\angle ADC = 120^\circ$

(C) $\angle DAC = 20^\circ$

(D) $\angle ABC = 60^\circ$

Q5. Consider the following figure:



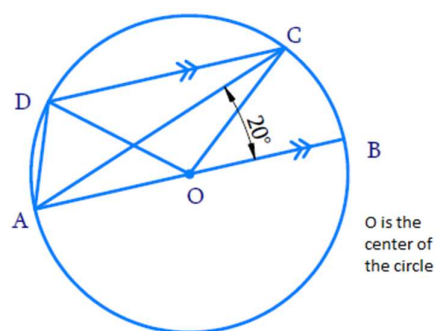
(A) $\angle BCE = 60^\circ$

(B) $\angle DBE = 110^\circ$

(C) $\angle OEB = 40^\circ$

(D) $\angle BCD = 30^\circ$

Q6. Consider the following figure:

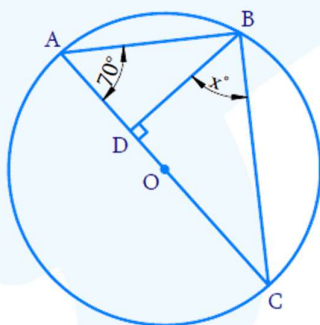


Which of the following are correct?

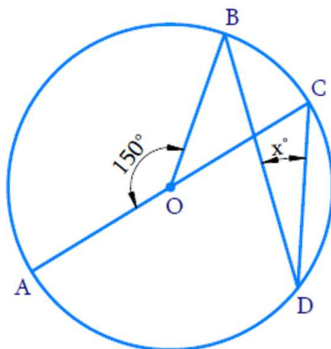
- (A) $\angle COD = 90^\circ$
- (B) $\angle CAD = 50^\circ$
- (C) $\angle BOC = 40^\circ$
- (D) $\angle ADC = 110^\circ$

Integer Answers

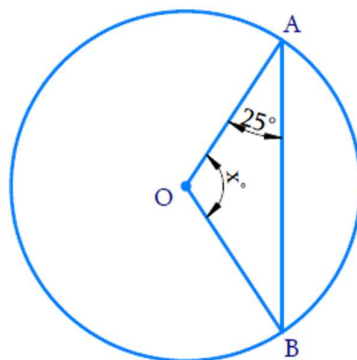
Q7. What is the value of x in the following figure?



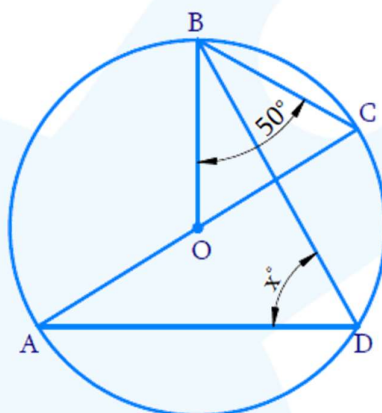
Q8. What is the value of x in the following figure?



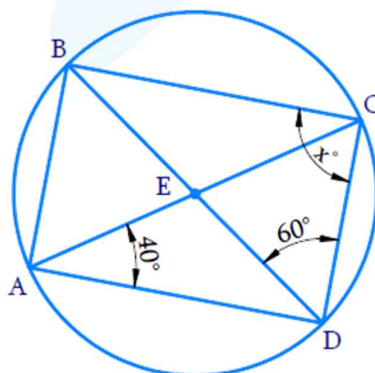
Q9. What is the value of x in the following figure?



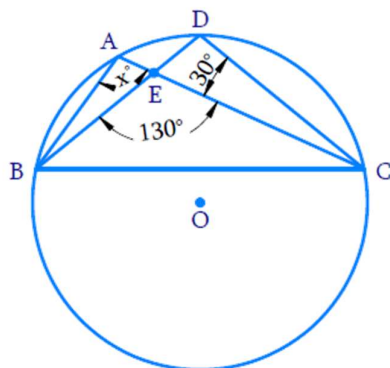
Q10. What is the value of x in the following figure?



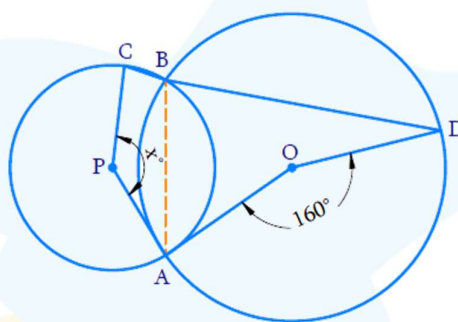
Q11. What is the value of x in the following figure?



Q12. What is the value of x in the following figure?



Q13. What is the value of x in the following figure?



Miscellaneous

Q14. Let P and Q be any two points on a circle S. Prove that the chord PQ lies entirely within S.

Q15. Suppose that two circles of radii r_1 and r_2 respectively intersect each other at two points. Let d be the distance between their centers. Prove that

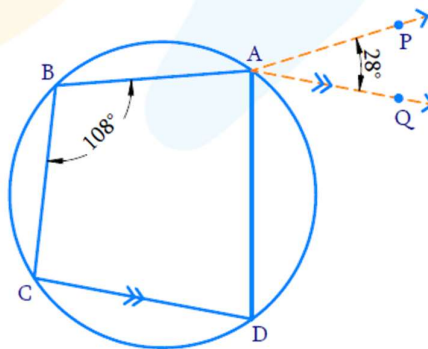
$$|r_1 - r_2| < d < r_1 + r_2$$

Q16. When two circles cut each other, prove that the line joining their centers bisects their common chord at right angles

Q17. (a) Under what condition will two chords of a circle bisect each other?

(b) PQRS is a parallelogram whose vertices lie on a circle. What can you say about its diagonals PR and QS?

- Q18.** Q is the mid-point of an arc PQR of a circle. Show that Q is equidistant from the radii through P and R.
- Q19.** Suppose that ABCD is a quadrilateral inscribed in a circle such that $AB = CD$. Prove that $AC = BD$.
- Q20.** The diagonals AC and BD of a quadrilateral inscribed in a circle are perpendicular. Show that AB and CD subtend supplementary angles at the center.
- Q21.** S is a fixed circle A variable chord of constant length “slides around” S. P is a point on the chord whose distance from the chord’s mid-point is fixed. What is the locus of P?
- Q22.** AB and CD are two diameters of a circle. CX is a chord parallel to AB. Show that B is the mid-point of $\widehat{DBE}$.
- Q23.** P and Q are the mid-points of two equal chords in a circle. The straight line joining P and Q meets the circle at A and B. Show that $AP = BQ$.
- Q24.** O is the center of the circumcircle of an acute $\triangle ABC$. What is the relation between $\angle OBC$ and $\angle BAC$?
- Q25.** Prove that this sum of the angles in the four segments exterior to a cyclic quadrilateral is equal to 540° .
- Q26.** ABCD is a cyclic quadrilateral. A circle through A and B meets AD and BC at E and F respectively. Show that $EF \parallel DC$.
- Q27.** ABCD is a cyclic quadrilateral. The bisectors of angles A and C meet the circle at P and Q. Show that PQ is a diameter of the circle.
- Q28.** Consider the following figure:



What is the measure of $\angle BCD$?