



# ST. LAWRENCE HIGH SCHOOL



A JESUIT CHRISTIAN MINORITY INSTITUTION

**CLASS 8**

**SUBJECT :Algebra & GeometryWork sheet28 answer key**

**Marks:15Circles**

**Date:31.5.21**

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**Answer all the following questions(1×15=15)**

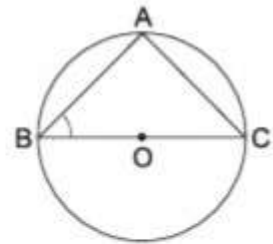
## MULTIPLE-CHOICE QUESTIONS (MCQ)

Choose the correct answer in each of the following:

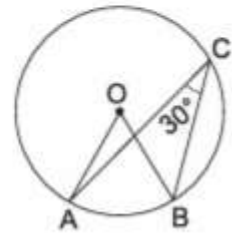
1. The radius of a circle is 13 cm and the length of one of its chords is 10 cm. The distance of the chord from the centre is  
(a) 11.5 cm (b) 12 cm  
(c)  $\sqrt{69}$  cm (d) 23 cm

2. A chord is at a distance of 8 cm from the centre of a circle of radius 17 cm. The length of the chord is  
(a) 25 cm (b) 12.5 cm  
(c) 30 cm (d) 9 cm

3. In the given figure,  $BOC$  is a diameter of a circle and  $AB = AC$ . Then,  $\angle ABC = ?$   
(a)  $30^\circ$  (b)  $45^\circ$   
(c)  $60^\circ$  (d)  $90^\circ$



4. In the given figure,  $O$  is the centre of a circle and  $\angle ACB = 30^\circ$ . Then,  $\angle AOB = ?$   
(a)  $30^\circ$  (b)  $15^\circ$   
(c)  $60^\circ$  (d)  $90^\circ$



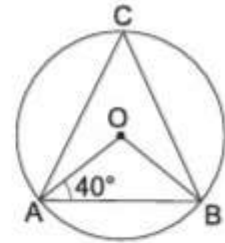
5. In the given figure,  $O$  is the centre of a circle. If  $\angle OAB = 40^\circ$  and  $C$  is a point on the circle then  $\angle ACB = ?$

(a)  $40^\circ$

(b)  $50^\circ$

(c)  $80^\circ$

(d)  $100^\circ$



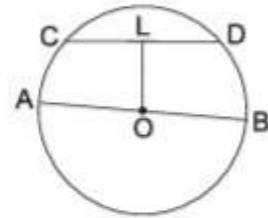
6. In the given figure,  $AOB$  is a diameter of a circle with centre  $O$  such that  $AB = 34$  cm and  $CD$  is a chord of length 30 cm. Then, the distance of  $CD$  from  $AB$  is

(a) 8 cm

(b) 15 cm

(c) 18 cm

(d) 6 cm



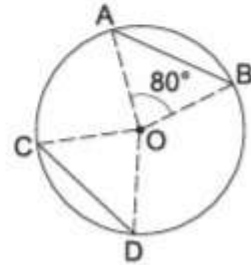
7.  $AB$  and  $CD$  are two equal chords of a circle with centre  $O$  such that  $\angle AOB = 80^\circ$ . Then,  $\angle COD = ?$

(a)  $100^\circ$

(b)  $80^\circ$

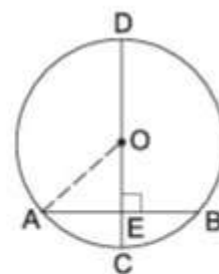
(c)  $120^\circ$

(d)  $40^\circ$



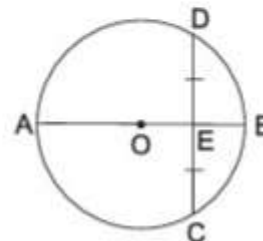
8. In the given figure,  $CD$  is the diameter of a circle with centre  $O$  and  $CD$  is perpendicular to chord  $AB$ . If  $AB = 12$  cm and  $CE = 3$  cm then radius of the circle is

- (a) 6 cm (b) 9 cm  
(c) 7.5 cm (d) 8 cm

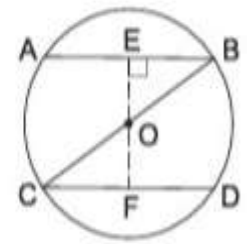


9. In the given figure,  $O$  is the centre of a circle and diameter  $AB$  bisects the chord  $CD$  at a point  $E$  such that  $CE = ED = 8$  cm and  $EB = 4$  cm. The radius of the circle is

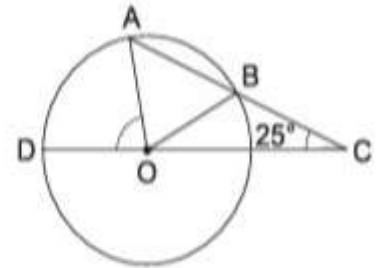
- (a) 10 cm (b) 12 cm  
(c) 6 cm (d) 8 cm



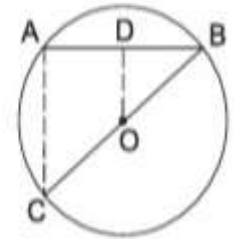
10. In the given figure,  $BOC$  is a diameter of a circle with centre  $O$ . If  $AB$  and  $CD$  are two chords such that  $AB \parallel CD$  and  $AB = 10$  cm then  $CD = ?$



- (a) 5 cm (b) 12.5 cm  
(c) 15 cm (d) 10 cm
11. In the given figure,  $AB$  is a chord of a circle with centre  $O$  and  $AB$  is produced to  $C$  such that  $BC = OB$ . Also,  $CO$  is joined and produced to meet the circle in  $D$ . If  $\angle ACD = 25^\circ$  then  $\angle AOD = ?$



- (a)  $50^\circ$  (b)  $75^\circ$   
(c)  $90^\circ$  (d)  $100^\circ$
12. In the given figure,  $AB$  is a chord of a circle with centre  $O$  and  $BOC$  is a diameter. If  $OD \perp AB$  such that  $OD = 6$  cm then  $AC = ?$



- (a) 9 cm (b) 12 cm  
(c) 15 cm (d) 7.5 cm
13. An equilateral triangle of side 9 cm is inscribed in a circle. The radius of the circle is
- (a) 3 cm (b)  $3\sqrt{2}$  cm (c)  $3\sqrt{3}$  cm (d) 6 cm
14. The angle in a semicircle measures
- (a)  $45^\circ$  (b)  $60^\circ$  (c)  $90^\circ$  (d)  $36^\circ$
15. Angles in the same segment of a circle are
- (a) equal (b) complementary  
(c) supplementary (d) none of these

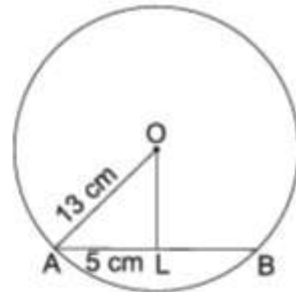
ANSWERS (MCQ) 1. (b) 2. (c) 3. (b) 4. (c) 5. (b) 6. (a) 7. (b) 8. (c) 9. (a) 10. (d) 11. (b) 12. (b) 13. (c) 14. (c) 15. (a)

1. Let  $O$  be the centre of a circle with radius  $OA = 13$  cm.  
Let  $AB$  be the chord of length 10 cm. Draw  $OL \perp AB$ .  
Then,  $L$  is the midpoint of  $AB$ . Thus,  $AL = 5$  cm.

$$OL^2 = OA^2 - AL^2 = (13)^2 - (5)^2 = 169 - 25 = 144$$

$$\Rightarrow OL = \sqrt{144} = 12 \text{ cm.}$$

Distance of the chord from the centre = 12 cm.

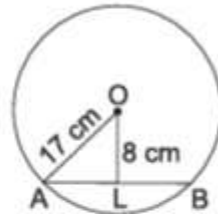


2. Here  $OA = 17$  cm and  $OL = 8$  cm.

$$\therefore AL^2 = OA^2 - OL^2 = (17)^2 - (8)^2 = 289 - 64 = 225.$$

$$\Rightarrow AL = \sqrt{225} = 15$$

$$\Rightarrow AB = (2 \times AL) = (2 \times 15) \text{ cm} = 30 \text{ cm.}$$



3. Since an angle in a semicircle is a right angle,  $\angle BAC = 90^\circ$ .

$$\therefore \angle ABC + \angle ACB = 90^\circ.$$

$$\text{Now, } AB = AC \Rightarrow \angle ABC = \angle ACB = 45^\circ.$$

4. Clearly,  $\angle AOB = (2 \times \angle AOC) = (2 \times 30^\circ) = 60^\circ$ .

5.  $OA = OB \Rightarrow \angle OBA = \angle OAB = 40^\circ$ .

$$\therefore \angle AOB = 180^\circ - (40^\circ + 40^\circ) = 100^\circ.$$

$$\therefore \angle ACB = \frac{1}{2} \angle AOB = \frac{1}{2} \times 100^\circ = 50^\circ.$$

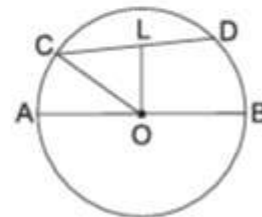
6. Join  $OC$ . Then,  $OC = \text{radius} = 17$  cm.

$$CL = \frac{1}{2} CD = \left(\frac{1}{2} \times 30\right) \text{ cm} = 15 \text{ cm.}$$

$$OL^2 = OC^2 - CL^2 = (17)^2 - (15)^2 = (17 + 15)(17 - 15) = (32 \times 2) = 64$$

$$\Rightarrow OL = \sqrt{64} = 8 \text{ cm.}$$

$$\therefore \text{distance of } CD \text{ from } AB = 8 \text{ cm.}$$



7. Since equal chords of a circle subtend equal angles at the centre, so  
 $\angle COD = \angle AOB = 80^\circ$ .

8. Let  $OA = OC = r$  cm. Then,  $OE = (r - 3)$  cm and  $AE = \frac{1}{2} AB = 6$  cm.

$$\text{Now, } OA^2 = OE^2 + AE^2 \Rightarrow r^2 = (r - 3)^2 + 6^2$$

$$\Rightarrow 6r = 45 \Rightarrow r = \frac{45}{6} = 7.5 \text{ cm.}$$

9. Let the radius of the circle be  $r$  cm.

Then,  $OD = OB = r$  cm,  $OE = (r - 4)$  cm,  $ED = 8$  cm.

Now,  $OD^2 = OE^2 + ED^2 \Rightarrow r^2 = (r - 4)^2 + 8^2$

$\therefore 8r = 80 \Rightarrow r = 10$  cm.

10. Draw  $OE \perp AB$  and  $OF \perp CD$ .

Then,  $\triangle OEB \cong \triangle OFC$

[ $\because OB = OC = r$ ,  $\angle BOE = \angle COF$  (vert. opp.  $\angle$ ) and  $\angle OEB = \angle OFC = 90^\circ$ ].

$\therefore OE = OF$ .

But, the chords equidistant from the centre are equal.

$\therefore CD = AB = 10$  cm.

11.  $OB = BC \Rightarrow \angle BOC = \angle BCO = 25^\circ$

Ext.  $\angle OBA = \angle BOC + \angle BCO = 25^\circ + 25^\circ = 50^\circ$ .

$OA = OB \Rightarrow \angle OAB = \angle OBA = 50^\circ$ .

In  $\triangle AOC$ , side  $CO$  has been produced to  $D$ .

$\therefore$  ext.  $\angle AOD = \angle OAC + \angle ACO = \angle OAB + \angle BCO = 50^\circ + 25^\circ = 75^\circ$ .

12.  $OD \perp AB \Rightarrow D$  is the midpoint of  $AB$ .

Also,  $O$  is the midpoint of  $BC$ .

Now, in  $\triangle BAC$ ,  $D$  is the midpoint of  $AB$  and  $O$  is the midpoint of  $BC$ .

$\therefore OD = \frac{1}{2}AC \Rightarrow AC = 2 \times OD = (2 \times 6)$  cm = 12 cm.



13. Let  $\triangle ABC$  be an equilateral triangle of side 9 cm.

Let  $AD$  be one of its medians.

Then,  $AD \perp BC$  and  $BD = 4.5$  cm.

$$\therefore AD = \sqrt{AB^2 - BD^2} = \sqrt{(9)^2 - \left(\frac{9}{2}\right)^2} = \sqrt{\frac{243}{4}} = \frac{9\sqrt{3}}{2} \text{ cm.}$$

Let  $G$  be the centroid of  $\triangle ABC$ .

Then,  $AG : GD = 2 : 1$ .

$$\therefore \text{radius} = AG = \frac{2}{3}AD = \left(\frac{2}{3} \times \frac{9\sqrt{3}}{2}\right) \text{ cm} = 3\sqrt{3} \text{ cm.}$$

14. The angle in a semicircle measures  $90^\circ$ .

15. The angles in the same segment of a circle are equal.

