

**G.C.A.2: Chords, Secants and Tangents 17**

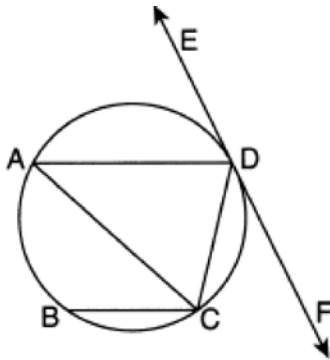
- 1 A small fragment of something brittle, such as pottery, is called a shard. The accompanying diagram represents the outline of a shard from a small round plate that was found at an archaeological dig.



If  $\overrightarrow{BC}$  is a tangent to  $\widehat{AB}$  at  $B$  and  $m\angle ABC = 45$ , what is the measure of  $\widehat{AB}$ , the outside edge of the shard?

- 1)  $45^\circ$
- 2)  $90^\circ$
- 3)  $135^\circ$
- 4)  $225^\circ$

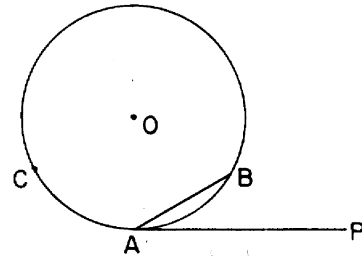
- 2 In the circle below,  $\overline{AD}$ ,  $\overline{AC}$ ,  $\overline{BC}$ , and  $\overline{DC}$  are chords,  $\overleftrightarrow{EDF}$  is tangent at point  $D$ , and  $\overline{AD} \parallel \overline{BC}$ .



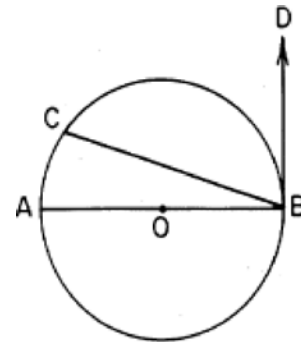
Which statement is always true?

- 1)  $\angle ADE \cong \angle CAD$
- 2)  $\angle CDF \cong \angle ACB$
- 3)  $\angle BCA \cong \angle DCA$
- 4)  $\angle ADC \cong \angle ADE$

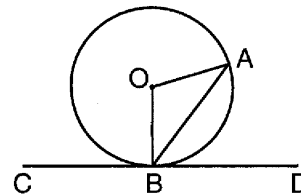
- 3 In the diagram below,  $\overline{PA}$  is tangent to circle  $O$ , and  $\overline{AB}$  is a chord. If  $m\widehat{ACB} = 300$ , find the measure of  $\angle BAP$ .



- 4 In the accompanying diagram,  $\overrightarrow{BD}$  is tangent to circle  $O$  at  $B$ ,  $\overline{BC}$  is a chord, and  $\overline{BOA}$  is a diameter. If  $m\widehat{AC} : m\widehat{CB} = 1 : 4$ , find  $m\angle DBC$ .



- 5 In the accompanying diagram,  $\overline{CD}$  is tangent to circle  $O$  at  $B$ ,  $\overline{AO}$  and  $\overline{BO}$  are radii, and chord  $\overline{AB}$  is drawn. If  $m\angle AOB = 108$ , find  $m\angle ABD$ .



**G.C.A.2: Chords, Secants and Tangents 17**  
**Answer Section**

1 ANS: 2

The angle formed by a tangent and a chord is half the intercepted arc. Since the angle is  $45^\circ$ , the intercepted arc is  $90^\circ$ .

REF: 010510b

2 ANS: 2

Since  $\overline{AD} \parallel \overline{BC}$ ,  $\widehat{AB} \cong \widehat{CD}$ .  $m\angle ACB = \frac{1}{2} m\widehat{AB}$

$$m\angle CDF = \frac{1}{2} m\widehat{CD}$$

REF: 012323geo

3 ANS:

30

REF: 068502siii

4 ANS:

72

REF: 068810siii

5 ANS:

54

REF: 019704siii