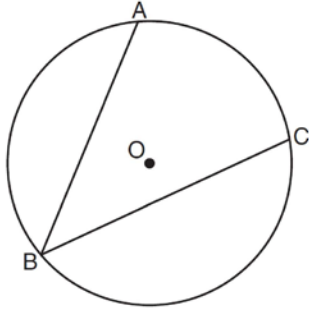


G.C.A.2: Chords, Secants and Tangents 11

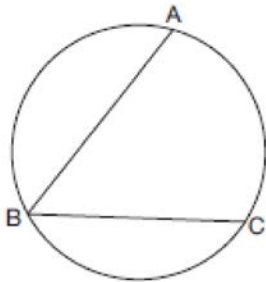
- 1 In the diagram below, $\angle ABC$ is inscribed in circle O .



The ratio of the measure of $\angle ABC$ to the measure of \widehat{AC} is

- 1) 1 : 1
- 2) 1 : 2
- 3) 1 : 3
- 4) 1 : 4

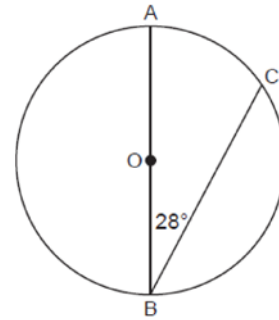
- 2 In the diagram below, $m\widehat{ABC} = 268^\circ$.



What is the number of degrees in the measure of $\angle ABC$?

- 1) 134°
- 2) 92°
- 3) 68°
- 4) 46°

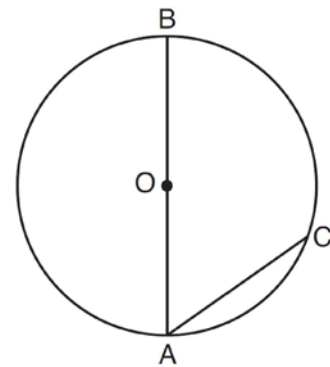
- 3 In the diagram below of Circle O , diameter \overline{AOB} and chord \overline{CB} are drawn, and $m\angle B = 28^\circ$.



What is $m\widehat{BC}$?

- 1) 56°
- 2) 124°
- 3) 152°
- 4) 166°

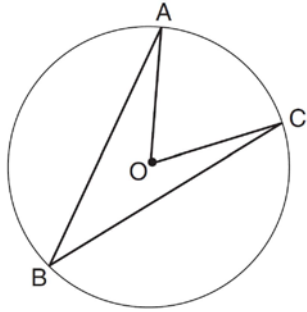
- 4 As shown in the diagram below, \overline{AB} is a diameter of circle O , and chord \overline{AC} is drawn.



If $m\angle BAC = 70$, then $m\widehat{AC}$ is

- 1) 40
- 2) 70
- 3) 110
- 4) 140

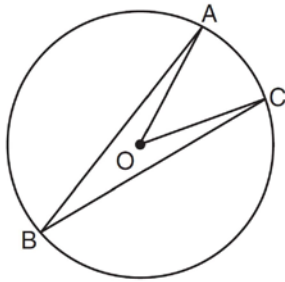
- 5 Circle O with $\angle AOC$ and $\angle ABC$ is shown in the diagram below.



What is the ratio of $m\angle AOC$ to $m\angle ABC$?

- 1) 1 : 1
- 2) 2 : 1
- 3) 3 : 1
- 4) 1 : 2

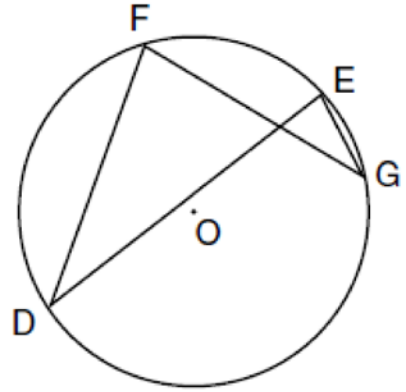
- 6 In the diagram below of circle O , $m\angle ABC = 24$.



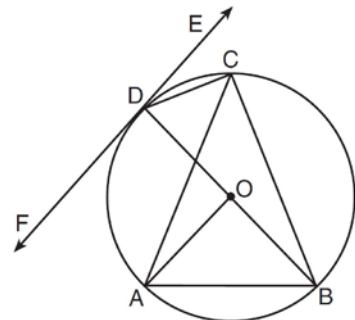
What is the $m\angle AOC$?

- 1) 12
- 2) 24
- 3) 48
- 4) 60

- 7 In the diagram below of circle O , chords \overline{DF} , \overline{DE} , \overline{FG} , and \overline{EG} are drawn such that $m\widehat{DF} : m\widehat{FE} : m\widehat{EG} : m\widehat{GD} = 5 : 2 : 1 : 7$. Identify one pair of inscribed angles that are congruent to each other and give their measure.



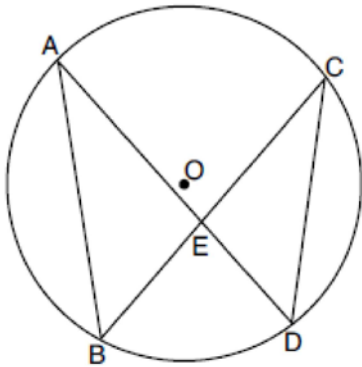
- 8 In the diagram below, \overline{DC} , \overline{AC} , \overline{DOB} , \overline{CB} , and \overline{AB} are chords of circle O , \overleftrightarrow{FDE} is tangent at point D , and radius \overline{AO} is drawn. Sam decides to apply this theorem to the diagram: “An angle inscribed in a semi-circle is a right angle.”



Which angle is Sam referring to?

- 1) $\angle AOB$
- 2) $\angle BAC$
- 3) $\angle DCB$
- 4) $\angle FDB$

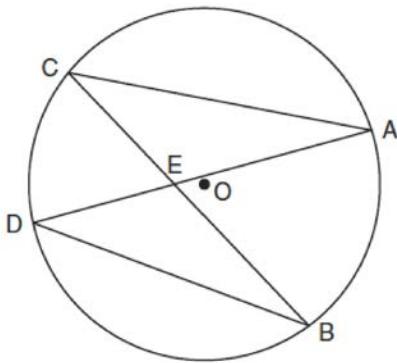
- 9 In the diagram below of circle O , chords \overline{AD} and \overline{BC} intersect at E , and chords \overline{AB} and \overline{CD} are drawn.



Which statement must always be true?

- 1) $\overline{AB} \cong \overline{CD}$
- 2) $\overline{AD} \cong \overline{BC}$
- 3) $\angle B \cong \angle C$
- 4) $\angle A \cong \angle C$

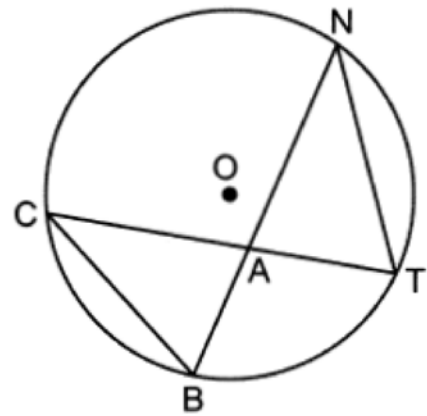
- 10 In the diagram below of circle O , chords \overline{AD} and \overline{BC} intersect at E .



Which relationship must be true?

- 1) $\triangle CAE \cong \triangle DBE$
- 2) $\triangle AEC \sim \triangle BED$
- 3) $\angle ACB \cong \angle CBD$
- 4) $\widehat{CA} \cong \widehat{DB}$

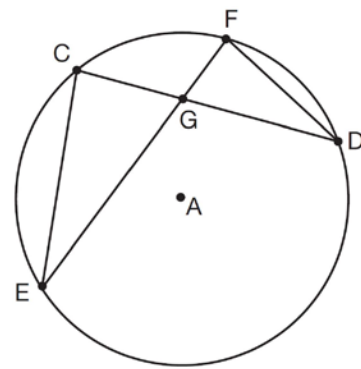
- 11 In circle O below, chords \overline{CT} and \overline{BN} intersect at point A . Chords \overline{CB} and \overline{NT} are drawn.



Which statement is always true?

- 1) $\frac{NT}{TA} = \frac{CB}{BA}$
- 2) $\angle BAC \cong \angle ATN$
- 3) $\frac{NA}{AB} = \frac{TA}{AC}$
- 4) $\angle BCA \cong \angle NTA$

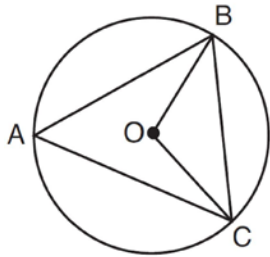
- 12 In the diagram of circle A shown below, chords \overline{CD} and \overline{EF} intersect at G , and chords \overline{CE} and \overline{FD} are drawn.



Which statement is *not* always true?

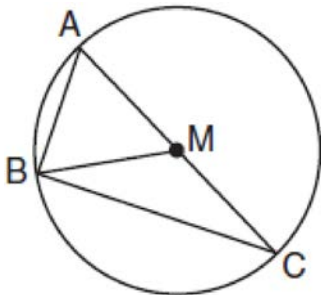
- 1) $\overline{CG} \cong \overline{FG}$
- 2) $\angle CEG \cong \angle FDG$
- 3) $\frac{CE}{EG} = \frac{FD}{DG}$
- 4) $\triangle CEG \sim \triangle FDG$

- 13 In the diagram below of circle O , \overline{OB} and \overline{OC} are radii, and chords \overline{AB} , \overline{BC} , and \overline{AC} are drawn.



Which statement must always be true?

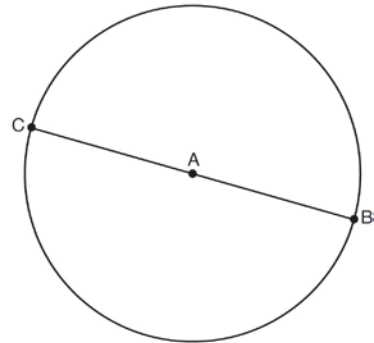
- 1) $\angle BAC \cong \angle BOC$
 - 2) $m\angle BAC = \frac{1}{2} m\angle BOC$
 - 3) $\triangle BAC$ and $\triangle BOC$ are isosceles.
 - 4) The area of $\triangle BAC$ is twice the area of $\triangle BOC$.
- 14 In circle M below, diameter \overline{AC} , chords \overline{AB} and \overline{BC} , and radius \overline{MB} are drawn.



Which statement is *not* true?

- 1) $\triangle ABC$ is a right triangle.
- 2) $\triangle ABM$ is isosceles.
- 3) $m\widehat{BC} = m\angle BMC$
- 4) $m\widehat{AB} = \frac{1}{2} m\angle ACB$

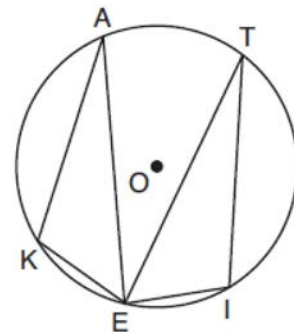
- 15 In the diagram below, \overline{BC} is the diameter of circle A .



Point D , which is unique from points B and C , is plotted on circle A . Which statement must always be true?

- 1) $\triangle BCD$ is a right triangle.
- 2) $\triangle BCD$ is an isosceles triangle.
- 3) $\triangle BAD$ and $\triangle CBD$ are similar triangles.
- 4) $\triangle BAD$ and $\triangle CAD$ are congruent triangles.

- 16 In the diagram below of circle O , points K, A, T, I , and E are on the circle, $\triangle KAE$ and $\triangle ITE$ are drawn, $\widehat{KE} \cong \widehat{EI}$, and $\angle EKA \cong \angle EIT$.



Which statement about $\triangle KAE$ and $\triangle ITE$ is always true?

- 1) They are neither congruent nor similar.
- 2) They are similar but not congruent.
- 3) They are right triangles.
- 4) They are congruent.

G.C.A.2: Chords, Secants and Tangents 11
Answer Section

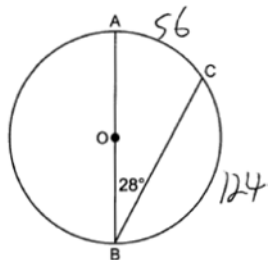
1 ANS: 2 REF: 011602ge

2 ANS: 4

$$\frac{1}{2}(360 - 268) = 46$$

REF: 061704geo

3 ANS: 2



REF: 062305geo

4 ANS: 1 REF: 081518ge

5 ANS: 2 REF: 061322ge

6 ANS: 3 REF: 011523ge

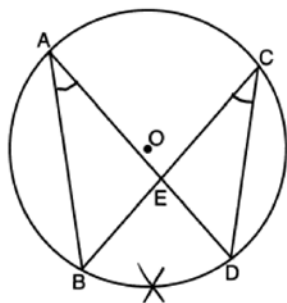
7 ANS:

$\angle D$, $\angle G$ and 24° or $\angle E$, $\angle F$ and 84° . $m\widehat{FE} = \frac{2}{15} \times 360 = 48$. Since the chords forming $\angle D$ and $\angle G$ are intercepted by \widehat{FE} , their measure is 24° . $m\widehat{GD} = \frac{7}{15} \times 360 = 168$. Since the chords forming $\angle E$ and $\angle F$ are intercepted by \widehat{GD} , their measure is 84° .

REF: fall0836ge

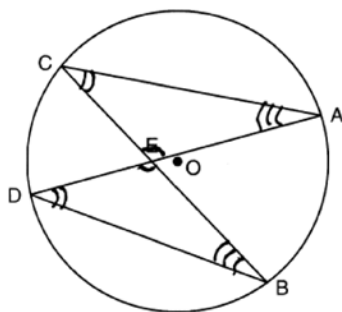
8 ANS: 3 REF: 011621geo

9 ANS: 4



REF: 082218geo

10 ANS: 2



REF: 061026ge

11 ANS: 1 REF: 062409geo

12 ANS: 1 REF: 061508geo

13 ANS: 2 REF: 061610geo

14 ANS: 4 REF: 011816geo

15 ANS: 1

The other statements are true only if $\overline{AD} \perp \overline{BC}$.

REF: 081623geo

16 ANS: 4 REF: 011905geo