G.C.A.2: Chords, Secants and Tangents 9
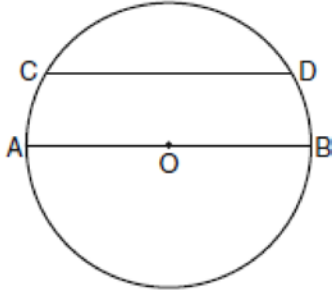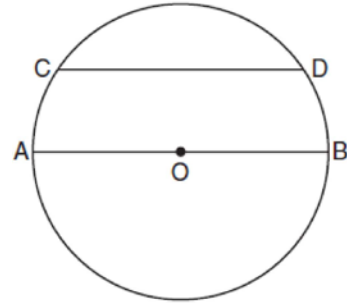
1 In the diagram of circle O below, chord $\overline{CD}$ is parallel to diameter $\overline{AOB}$ and $m\overset{\frown}{AC} = 30$.

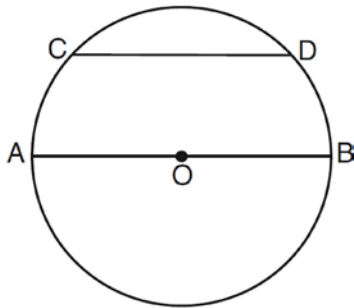What is $m\overset{\frown}{CD}$?
1) 150
2) 120
3) 100
4) 60

3 In the diagram below of circle O, chord $\overline{CD}$ is parallel to diameter $\overline{AOB}$ and $m\overset{\frown}{CD} = 130$.

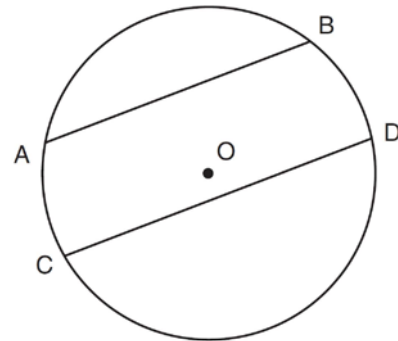What is $m\overset{\frown}{AC}$?
1) 25
2) 50
3) 65
4) 115

2 In the diagram below of circle O, diameter $\overline{AB}$ is parallel to chord $\overline{CD}$.

If $m\overset{\frown}{CD} = 70$, what is $m\overset{\frown}{AC}$?
1) 110
2) 70
3) 55
4) 35

4 In circle O shown in the diagram below, chords $\overline{AB}$ and $\overline{CD}$ are parallel.

If $m\overset{\frown}{AB} = 104$ and $m\overset{\frown}{CD} = 168$, what is $m\overset{\frown}{BD}$?
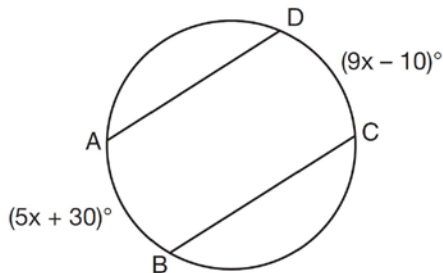1) 38
2) 44
3) 88
4) 96

5   In the diagram of circle O below, chord $\overline{CD}$ is parallel to diameter $\overline{AOB}$ and $m\overset{\frown}{CD} = 110$.
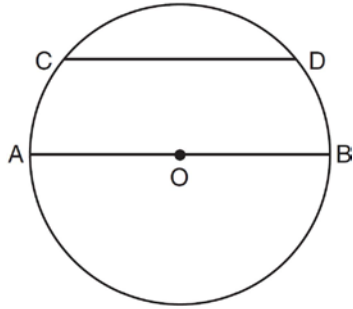
What is $m\overset{\frown}{DB}$?
1)   35
2)   55
3)   70
4)   110

6   In the diagram of the circle below, $\overline{AD} \parallel \overline{BC}$, $\overset{\frown}{AB} = (5x + 30)°$, and $\overset{\frown}{CD} = (9x - 10)°$.
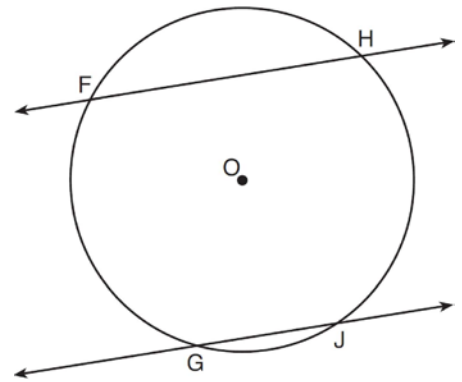

What is $m\overset{\frown}{AB}$?
1)   5
2)   10
3)   55
4)   80

7   In the diagram below, two parallel lines intersect circle O at points A, B, C, and D, with $m\overset{\frown}{AB} = x + 20$ and $m\overset{\frown}{DC} = 2x - 20$. Find $m\overset{\frown}{AB}$.
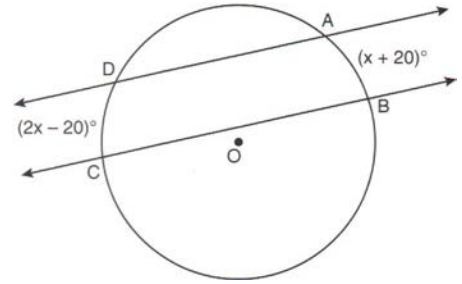
8   Parallel secants $\overset{\longleftrightarrow}{FH}$ and $\overset{\longleftrightarrow}{GJ}$ intersect circle O, as shown in the diagram below.

If $m\overset{\frown}{FH} = 106$ and $m\overset{\frown}{GJ} = 24$, then $m\overset{\frown}{FG}$ equals
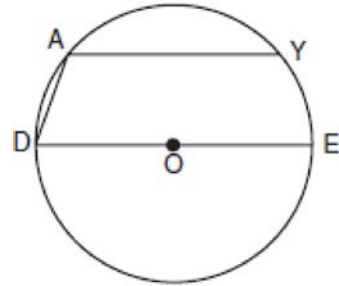1)   106
2)   115
3)   130
4)   156

9   In the diagram of circle O below, chords $\overline{AB}$ and $\overline{CD}$ are parallel, and $\overline{BD}$ is a diameter of the circle.
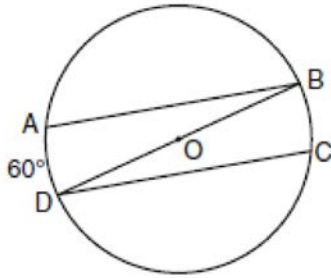
If $m\overgroup{AD} = 60$, what is $m\angle CDB$?
1)   20
2)   30
3)   60
4)   120

10   In the accompanying diagram of circle O, chords $\overline{AC}$ and $\overline{WF}$ are drawn, $\overline{AOF}$ is a diameter, $\overline{AC} \parallel \overline{WF}$, and $m\angle AFW = 60$. Find $m\overgroup{AC}$.
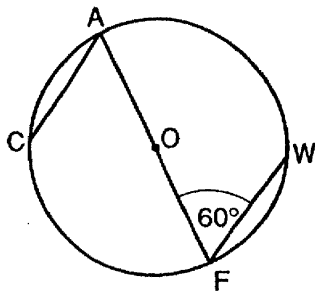
11   In the accompanying diagram of circle O, chord $\overline{AY}$ is parallel to diameter $\overline{DOE}$, $\overline{AD}$ is drawn, and $m\overgroup{AD} = 40$.

What is $m\angle DAY$?
1)   90
2)   110
3)   130
4)   150

12   In the diagram below of circle O with diameter $\overline{BC}$ and radius $\overline{OA}$, chord $\overline{DC}$ is parallel to chord $\overline{BA}$.
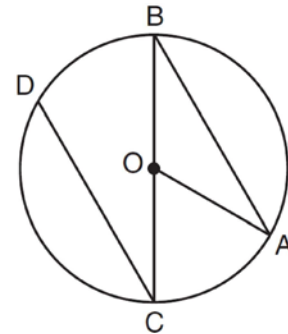
If $m\angle BCD = 30°$, determine and state $m\angle AOB$.

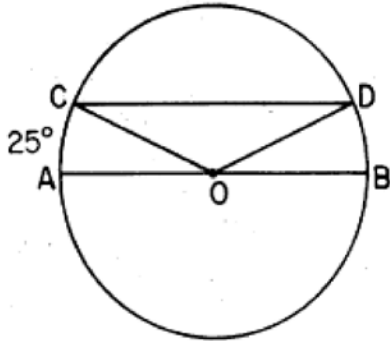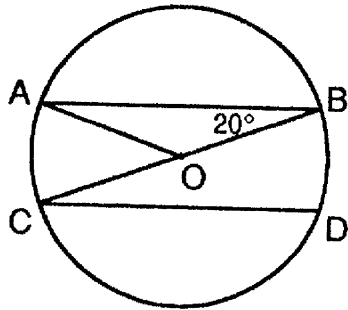13 In the accompanying diagram, chord $\overline{CD}$ is parallel to diameter $\overline{AB}$. If m$\overarc{AC}$ = 25, what is m∠COD?
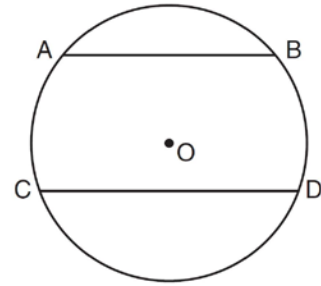
1) 25
2) 65
3) 130
4) 155

14 In the accompanying diagram of circle O, $\overline{AB} \parallel \overline{CD}$, $\overline{BC}$ is a diameter, and radius $\overline{AO}$ is drawn. If m∠ABC = 20, find m$\overarc{BD}$.

15 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{CD}$.

A correct justification for m$\overarc{AC}$ = m$\overarc{BD}$ in circle O is
1) parallel chords intercept congruent arcs
2) congruent chords intercept congruent arcs
3) if two chords are parallel, then they are congruent
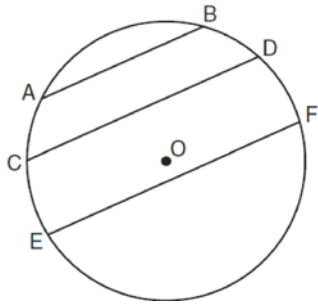4) if two chords are equidistant from the center, then the arcs they intercept are congruent

16 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{CD}$.
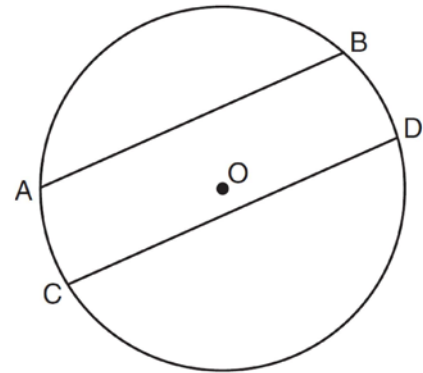
Which statement must be true?
1) $\overarc{AC} \cong \overarc{BD}$
2) $\overarc{AB} \cong \overarc{CD}$
3) $\overline{AB} \cong \overline{CD}$
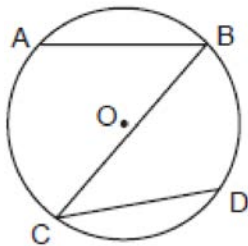4) $\overarc{ABD} \cong \overarc{CDB}$

17   In the diagram below of circle O, chord $\overline{AB}\,\|$ chord $\overline{CD}$, and chord $\overline{CD}\,\|$ chord $\overline{EF}$.

Which statement must be true?
1) $\overset{\frown}{CE} \cong \overset{\frown}{DF}$
2) $\overset{\frown}{AC} \cong \overset{\frown}{DF}$
3) $\overset{\frown}{AC} \cong \overset{\frown}{CE}$
4) $\overset{\frown}{EF} \cong \overset{\frown}{CD}$

18   In the accompanying diagram of circle O, $\overset{\frown}{AB} \cong \overset{\frown}{CD}$.

Which statement is true?
1) $\overline{AB} \cong \overline{CD}$
2) $\overset{\frown}{AC} \cong \overset{\frown}{BD}$
3) $\overline{AB} \,\|\, \overline{CD}$
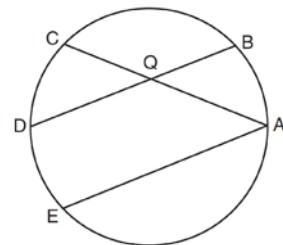4) $\angle ABC \cong \angle BCD$

19   In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{GH}$. Chord $\overline{CD}$ intersects $\overline{AB}$ at E and $\overline{GH}$ at F.
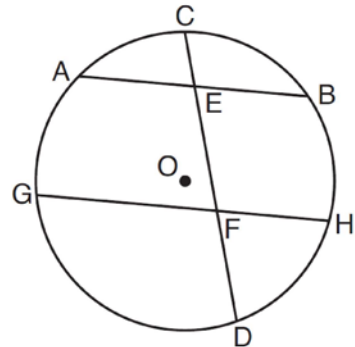
Which statement must always be true?
1) $\overset{\frown}{AC} \cong \overset{\frown}{CB}$
2) $\overset{\frown}{DH} \cong \overset{\frown}{BH}$
3) $\overset{\frown}{AB} \cong \overset{\frown}{GH}$
4) $\overset{\frown}{AG} \cong \overset{\frown}{BH}$

20   In the diagram of the circle shown below, chords $\overline{AC}$ and $\overline{BD}$ intersect at Q, and chords $\overline{AE}$ and $\overline{BD}$ are parallel.

Which statement must always be true?
1) $\overset{\frown}{AB} \cong \overset{\frown}{CD}$
2) $\overset{\frown}{DE} \cong \overset{\frown}{CD}$
3) $\overset{\frown}{AB} \cong \overset{\frown}{DE}$
4) $\overset{\frown}{BD} \cong \overset{\frown}{AE}$

5

21 In circle O shown below, chord $\overline{AB}$ and diameter
$\overline{CD}$ are parallel, and chords $\overline{AD}$ and $\overline{BC}$ intersect at
point E.
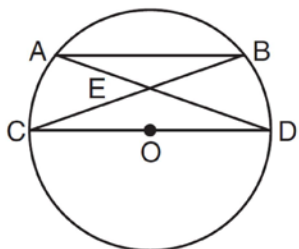
Which statement is *false*?
1) $\overset{\frown}{AC} \cong \overset{\frown}{BD}$
2) $BE = CE$
3) $\triangle ABE \sim \triangle CDE$
4) $\angle B \cong \angle C$

22 Points A, B, C, and D are located on circle O,
forming trapezoid $ABCD$ with $\overline{AB} \parallel \overline{DC}$. Which
statement must be true?
1) $\overline{AB} \cong \overline{DC}$
2) $\overset{\frown}{AD} \cong \overset{\frown}{BC}$
3) $\angle A \cong \angle D$
4) $\overset{\frown}{AB} \cong \overset{\frown}{DC}$

G.C.A.2: Chords, Secants and Tangents 9
Answer Section

1 ANS: 2

Parallel chords intercept congruent arcs. $m\widehat{AC} = m\widehat{BD} = 30$. $180 - 30 - 30 = 120$.

REF: 080904ge

2 ANS: 3

$\dfrac{180 - 70}{2} = 55$

REF: 061205ge

3 ANS: 1

Parallel chords intercept congruent arcs. $\dfrac{180 - 130}{2} = 25$

REF: 081704geo

4 ANS: 2

Parallel chords intercept congruent arcs. $\dfrac{360 - (104 + 168)}{2} = 44$

REF: 011302ge

5 ANS: 1

Parallel chords intercept congruent arcs. $m\widehat{AC} = m\widehat{BD}$. $\dfrac{180 - 110}{2} = 35$.

REF: 081302ge

6 ANS: 4

$9x - 10 = 5x + 30$ $5(10) + 30 = 80$

$\quad 4x = 40$

$\quad\ x = 10$

REF: 011525ge

7 ANS:

$2x - 20 = x + 20$. $m\widehat{AB} = x + 20 = 40 + 20 = 60$

$\quad x = 40$

REF: 011229ge

8 ANS: 2

Parallel secants intercept congruent arcs. $\dfrac{360 - (106 + 24)}{2} = \dfrac{230}{2} = 115$

REF: 081503ge

9 ANS: 2

Parallel chords intercept congruent arcs. $m\overset{\frown}{AD} = m\overset{\frown}{BC} = 60$. $m\angle CDB = \frac{1}{2} m\overset{\frown}{BC} = 30$.

REF: 060906ge

10 ANS:

60

REF: 019501siii

11 ANS: 2

Parallel chords intercept equal arcs. If $m\overset{\frown}{AD} = 40$, then $m\overset{\frown}{EY} = 40$ as well. The diameter of a circle divides the circle into two 180° arcs. So $m\overset{\frown}{DEY} = 220$. The measure of an inscribed angle is half that of
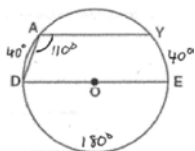
its intercepted arc. So $m\angle DAY = 110$.

REF: 060603b

12 ANS:
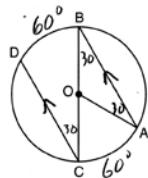
$180 - 2(30) = 120$

REF: 011626geo

13 ANS: 3   REF: 088519siii

14 ANS:

40

REF: 069403siii

15 ANS: 1

Parallel lines intercept congruent arcs.

REF: 081413ge

16 ANS: 1

Parallel lines intercept congruent arcs.

REF: 061105ge

17 ANS: 1

Parallel lines intercept congruent arcs.

REF: 061001ge

18 ANS: 1   REF: 060811b

19 ANS: 4
Parallel lines intercept congruent arcs.

REF: 081201ge
20 ANS: 3
Parallel lines intercept congruent arcs.

REF: 061409ge
21 ANS: 2   REF: 011616ge
22 ANS: 2   REF: 061516ge