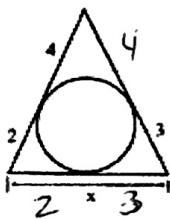# CIRCLES

$53 = \frac{1}{2}(3x+3+10x-14)$
$106 = 13x-11$
$117 = 13x$

1)

In the diagram at the right, the segments shown are tangent to the circle. Find the value of x.

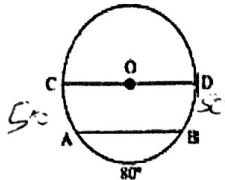[1] 5   [2] 6   [3] 7   [4] 9

4

2   x   3

2)

Given: Circle O with diameter $\overline{CD}$, $\overline{AB} \parallel \overline{CD}$ and $m\widehat{AB} = 80°$. Find $m\widehat{CA}$.

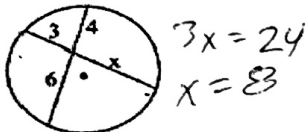[1] 50   [2] 60   [3] 80   [4] 100

5x

80°

3)

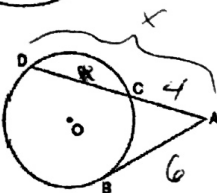Given the circle at the right with two intersecting chords. Find the length represented as x.

[1] 2   [2] 6   [3] 8   [4] 10

3   4

6   x

$3x = 24$
$x = 8$

4)

In the accompanying diagram, tangent $\overline{AB}$ and secant $\overline{ACD}$ are drawn to circle O from point A, AB = 6 and AC = 4. Find AD.

[1] 5   [2] 9   [3] 10   [4] 13
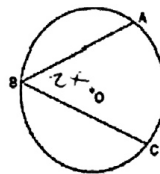
x

D   C   4

o   A

6   B

$4x = 6^2$

5)

In the accompanying diagram of circle O, $m\angle ABC = 2x$ and $m\widehat{AC} = x + 60$. Find the value of x.

[1] 20   [2] 40   [3] 60   [4] 80

A

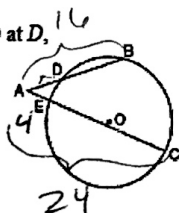B   2x   o   x+60

C

$2x = \frac{1}{2}(x+60)$
$4x = x+60$
$3x = 60$

6)

In the diagram at the right, secant AB intersects circle O at D, secant $\overline{AC}$ intersects circle O at E, AE = 4, AC = 24, and AB = 16. Find AD.

[1] 4   [2] 5   [3] 6   [4] 10

16

B

D

A   E   o

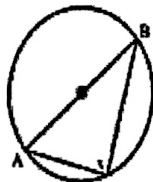4   C

24

$4(24) = x \cdot 16$
$96 = 16x$

7)

Given the circle at the right with diameter $\overline{AB}$, find x.

[1] 30°   [2] 45°   [3] 60°   [4] 90°

B

o

A   x

8)

Given a circle with the center indicated. Find x.
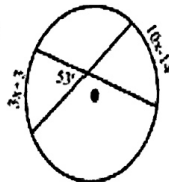
[1] 100   [3] 50
[2] 80   [4] 40

x

40°

50°

9)

Two chords intersect within a circle to form an angle whose measure is 53°. If the intercepted arcs are represented by 3x + 3 and 10x - 14, find the measure of larger of these two arcs.
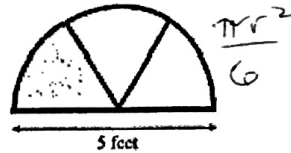
[1] 9   [2] 13   [3] 30   [4] 76

10x-14

53°

3x+3

10)

A cathedral window is built in the shape of a semicircle. If the window is to contain three stained glass sections of equal size, what is the area of each stained glass section? Express answer to the *nearest square foot*.
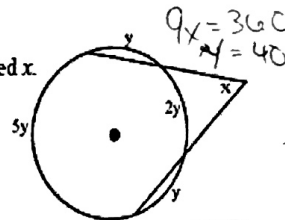
[1] 1 sq. ft.   [3] 13 sq. ft.
[2] 3 sq. ft.   [4] 26 sq. ft.

$\frac{\pi r^2}{6}$

5 feet

11)

Given the two secants shown in the diagram at the right, find the number of degrees in the angle labeled x.

[1] 40°   [2] 60°   [3] 80°   [4] 140°

$9x = 360$
$x = 40$

y

x

2y

5y

$x = \frac{1}{2}(5y - 2y)$
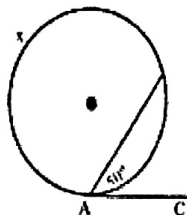$x = \frac{1}{2}(200 - 80)$

12)

The number of common tangents that can be drawn for two externally tangent circles is   [1] 1   [2] 2   [3] 3   [4] 4

13)

Given tangent $\overline{AC}$ to the circle shown at the right. Find the size of the arc designated by x.
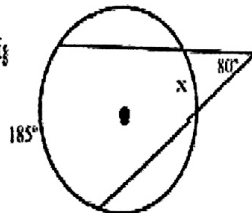
[1] 25   [2] 50   [3] 100   [4] 260

x

A   C

14)

Given a circle with two secants as shown at the right. Find the value of the arc designated by x.
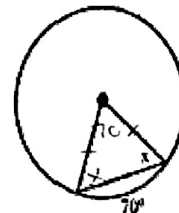
[1] 105   [3] 45
[2] 80   [4] 25

80°

x

185°

$x = \frac{1}{2}|185 - x|$
$160 = 185 - x$

15)

Given the circle at the right with the indicated center. Find the measure of the angle designated by x.

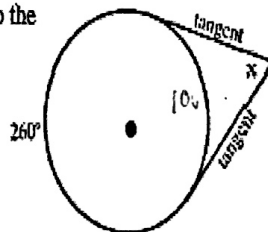[1] 35   [2] 55   [3] 70   [4] 72.5

70°   x

70°

16)

Given the circle at the right with two tangents to the circle from a common external point. Find the measure of the angle designated by x.

[1] 60   [2] 80   [3] 85   [4] 130

tangent

x

260°
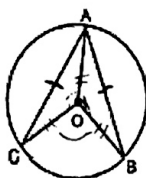
tangent

$\frac{360}{2}$

$\frac{260}{-100}$

$\frac{160}{2} = 80$

CIRCLES continued

17)

Given: $\overline{AB} \cong \overline{AC}$ in circle O at the right. Which method for proving congruent triangles can be used to prove that $\triangle ACO \cong \triangle ABO$?
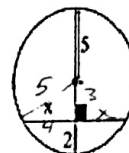
[1] Side-Side-Side (SSS)   [3] Angle-Side-Angle (ASA)

[2] Side-Angle-Side (SAS)   [4] All of the above.

18)

In the same circle, or congruent circles, congruent central angles have congruent arcs.   [1] TRUE   [2] FALSE

19)

Given the circle at the right with designated center, designated perpendicular, and radius 5. Find length of segment labeled x.

[1] 4   [2] 5   [3] 8   [4] $\sqrt{10}$

20)

Given: tangent $\overline{AD}$, diameter $\overline{CD}$, secant $\overline{AC}$ in circle O shown at the right. Which two sets of congruent angles can be used to prove $\triangle ADC \sim \triangle DBC$?

[1] $\angle 1 \cong \angle 1$ and $\angle ADC \cong \angle 5$

[2] $\angle 1 \cong \angle 1$ and $\angle ADC \cong \angle 4$

[3] $\angle 1 \cong \angle 6$ and $\angle ADC \cong \angle 4$

[4] $\angle 2 \cong \angle 6$ and $\angle ADC \cong \angle 4$