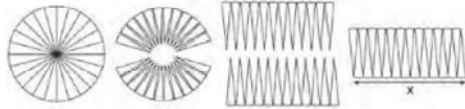


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CONICS 65, 70, 77
84, 87, 94
 G.GMD.A.1: CIRCUMFERENCE

63 A circle with a radius of 5 was divided into 24 congruent sectors. The sectors were then rearranged, as shown in the diagram below.



To the nearest integer, the value of x is

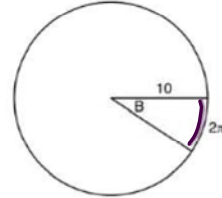
- 1 31
- 2 16
- 3 12
- 4 10

64 A designer needs to create perfectly circular necklaces. The necklaces each need to have a radius of 10 cm. What is the largest number of necklaces that can be made from 1000 cm of wire?

- 1 15
- 2 16
- 3 31
- 4 32

G.C.B.5: ARC LENGTH

65 In the diagram below, the circle shown has radius 10. Angle B intercepts an arc with a length of 2π .



What is the measure of angle B , in radians?

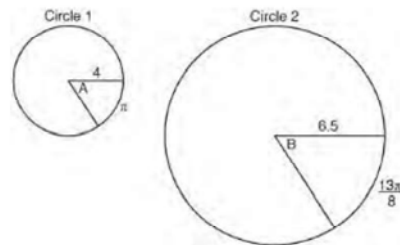
- 1 $10 + 2\pi$
- 2 20π
- 3 $\frac{\pi}{5}$
- 4 $\frac{5}{\pi}$

$$S = r\theta$$

$$\frac{2\pi}{10} = \frac{10\theta}{10}$$

$$\theta = \frac{2\pi}{10} = \frac{\pi}{5}$$

66 In the diagram below, Circle 1 has radius 4, while Circle 2 has radius 6.5. Angle A intercepts an arc of length π , and angle B intercepts an arc of length $\frac{13\pi}{8}$.

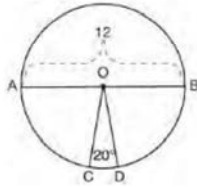


Dominic thinks that angles A and B have the same radian measure. State whether Dominic is correct or not. Explain why.

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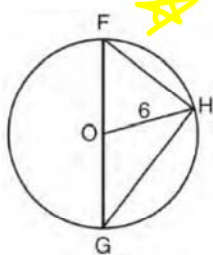
G.C.B.5: SECTORS

67 In the diagram below of circle O , diameter \overline{AB} and radii \overline{OC} and \overline{OD} are drawn. The length of \overline{AB} is 12 and the measure of $\angle COD$ is 20 degrees.



If $\widehat{AC} \cong \widehat{BD}$, find the area of sector BOD in terms of π .

68 Triangle $\triangle FGH$ is inscribed in circle O , the length of radius \overline{OH} is 6, and $\overline{FH} \cong \overline{OG}$.

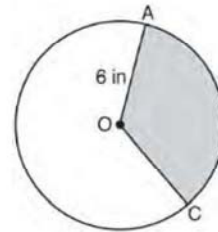


$A_{\text{sector}} = \frac{n}{360} \cdot \pi r^2$
 $2\pi = \frac{n}{360} \cdot 9\pi$
 $2 = \frac{9n}{360}$
 $\frac{9n}{9} = \frac{720}{9}$
 $n = 80$

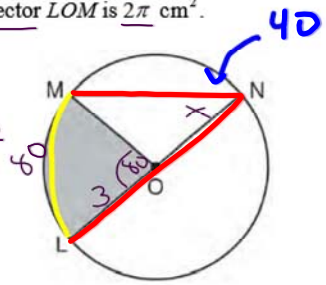
What is the area of the sector formed by angle $\angle FOH$?

- 1 2π
- 2 $\frac{3}{2}\pi$
- 3 6π
- 4 24π

69 In the diagram below of circle O , the area of the shaded sector AOC is $12\pi \text{ m}^2$ and the length of \overline{OA} is 6 inches. Determine and state $m\angle AOC$.



70 In the diagram below of circle O , the area of the shaded sector LOM is $2\pi \text{ cm}^2$.



If the length of \overline{NL} is 6 cm, what is $m\angle N$?

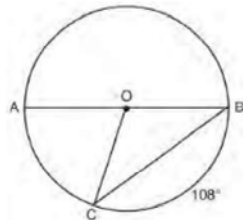
- 1 10°
- 2 20°
- 3 40°
- 4 80°

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71 What is the area of a sector of a circle with a radius of 8 inches and formed by a central angle that measures 60° ?

- 1 $\frac{8\pi}{3}$
- 2 $\frac{16\pi}{3}$
- 3 $\frac{32\pi}{3}$
- 4 $\frac{64\pi}{3}$

72 In circle O , diameter \overline{AB} , chord \overline{BC} , and radius \overline{OC} are drawn, and the measure of arc \overline{BC} is 108° .



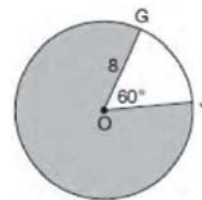
Some students wrote these formulas to find the area of sector COB :

- Amy $\frac{3}{10} \cdot \pi \cdot (BC)^2$
 Beth $\frac{108}{360} \cdot \pi \cdot (OC)^2$
 Carl $\frac{3}{10} \cdot \pi \cdot (\frac{1}{2} AB)^2$
 Dex $\frac{108}{360} \cdot \pi \cdot \frac{1}{2} (AB)^2$

Which students wrote correct formulas?

- 1 Amy and Dex
- 2 Beth and Carl
- 3 Carl and Amy
- 4 Dex and Beth

73 In the diagram below of circle O , $GO = 8$ and $m\angle GOJ = 60^\circ$.

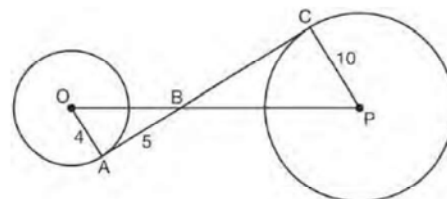


What is the area, in terms of π , of the shaded region?

- 1 $\frac{4\pi}{3}$
- 2 $\frac{20\pi}{3}$
- 3 $\frac{32\pi}{3}$
- 4 $\frac{160\pi}{3}$

G.C.A.2: CHORDS, SECANTS AND TANGENTS

74 In the diagram shown below, \overline{AC} is tangent to circle O at A and to circle P at C , \overline{OP} intersects \overline{AC} at B , $OA = 4$, $AB = 5$, and $PC = 10$.

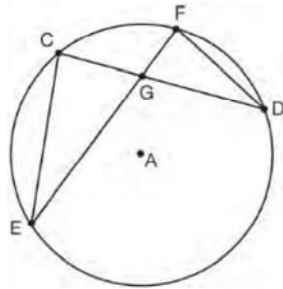


What is the length of \overline{BC} ?

- 1 6.4
- 2 8
- 3 12.5
- 4 16

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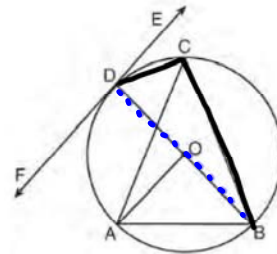
- 75 In the diagram of circle A shown below, chords \overline{CD} and \overline{EF} intersect at G , and chords \overline{CE} and \overline{FD} are drawn.



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 $\triangle CEG \sim \triangle FDG$

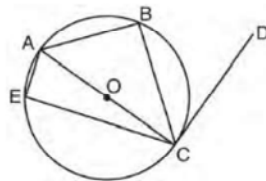
- 77 In the diagram below, \overline{DC} , \overline{AC} , \overline{DOB} , \overline{CB} , and \overline{AB} are chords of circle O , \overline{FDE} is tangent at point D , and radius \overline{AO} is drawn. Sam decides to apply this theorem to the diagram: "An angle inscribed in a semi-circle is a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



Which angle is Sam referring to?

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

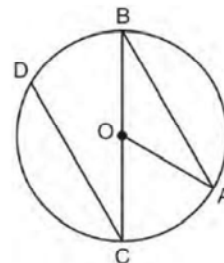
- 76 In circle O shown below, diameter \overline{AC} is perpendicular to \overline{CD} at point C , and chords \overline{AB} , \overline{BC} , \overline{AE} , and \overline{CE} are drawn.



Which statement is *not* always true?

- 1 $\angle ACB \cong \angle BCD$
- 2 $\angle ABC \cong \angle ACD$
- 3 $\angle BAC \cong \angle DCB$
- 4 $\angle CBA \cong \angle AEC$

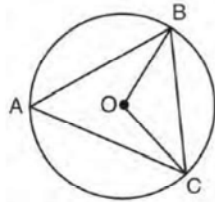
- 78 In the diagram below of circle O with diameter \overline{BC} and radius \overline{OA} , chord \overline{DC} is parallel to chord \overline{BA} .



If $m\angle BCD = 30^\circ$, determine and state $m\angle AOB$.

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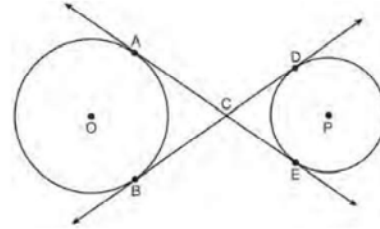
- 79 In the diagram below of circle O , \overline{OB} and \overline{OC} are radii, and chords \overline{AB} , \overline{BC} , and \overline{AC} are drawn.



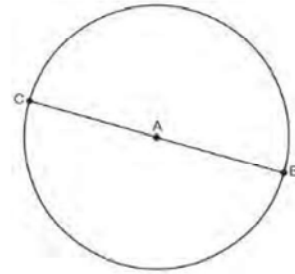
Which statement must always be true?

- 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 $\triangle BOC$.
- 80 In circle O , secants \overline{ADB} and \overline{AEC} are drawn from external point A such that points $D, B, E,$ and C are on circle O . If $AD = 8$, $AE = 6$, and EC is 12 more than BD , the length of BD is
- 1 6
 - 2 22
 - 3 36
 - 4 48

- 81 Lines AE and BD are tangent to circles O and P at $A, E, B,$ and D , as shown in the diagram below. If $AC:CE = 5:3$, and $BD = 56$, determine and state the length of CD .



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

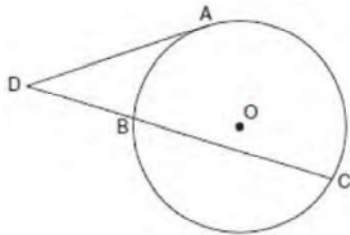


Point D , which is unique from points B and C , is plotted on circle A . Which statement must always be true?

- 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.

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- 83 In the diagram below, tangent \overline{DA} and secant \overline{DBC} are drawn to circle O from external point D , such that $\widehat{AC} \cong \widehat{BC}$.

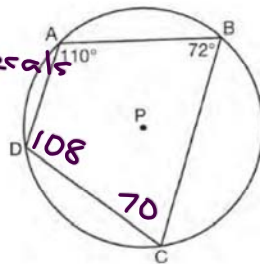


If $m\widehat{BC} = 152^\circ$, determine and state $m\angle D$.

G.C.A.3: INSCRIBED QUADRILATERALS

- 84 In the diagram below, quadrilateral $ABCD$ is inscribed in circle P .

★
Inscribed quadrilaterals
Opp \angle 's
SUPP



What is $m\angle ADC$?

- 1 70°
- 2 72°
- 3 108°
- 4 110°

$$x^2 + 6x + 9 + y^2 - 4y + 4 = 23$$

$$(x+3)^2 + (y-2)^2 = 36$$

$$(-3, 2)$$

G.GPE.A.1: EQUATIONS OF CIRCLES

- 85 The equation of a circle is $x^2 + y^2 + 6y = 7$. What are the coordinates of the center and the length of the radius of the circle?
- 1 center $(0,3)$ and radius 4
 - 2 center $(0,-3)$ and radius 4
 - 3 center $(0,3)$ and radius 16
 - 4 center $(0,-3)$ and radius 16

- 86 If $x^2 + 4x + y^2 - 6y - 12 = 0$ is the equation of a circle, the length of the radius is
- 1 25
 - 2 16
 - 3 5
 - 4 4



- 87 What are the coordinates of the center and length of the radius of the circle whose equation is $x^2 + 6x + y^2 - 4y = 23$?
- 1 $(3,-2)$ and 36
 - 2 $(3,-2)$ and 6
 - 3 $(-3,2)$ and 36
 - 4 $(-3,2)$ and 6

- 88 What are the coordinates of the center and the length of the radius of the circle represented by the equation $x^2 + y^2 - 4x + 8y + 11 = 0$?
- 1 center $(2,-4)$ and radius 3
 - 2 center $(-2,4)$ and radius 3
 - 3 center $(2,-4)$ and radius 9
 - 4 center $(-2,4)$ and radius 9

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- 89 Kevin's work for deriving the equation of a circle is shown below.

$$x^2 + 4x = -(y^2 - 20)$$

STEP 1 $x^2 + 4x = -y^2 + 20$

STEP 2 $x^2 + 4x + 4 = -y^2 + 20 - 4$

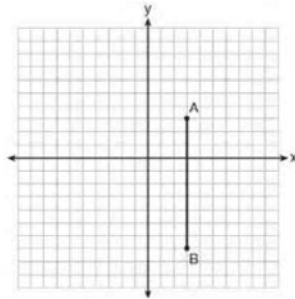
STEP 3 $(x + 2)^2 = -y^2 + 20 - 4$

STEP 4 $(x + 2)^2 + y^2 = 16$

In which step did he make an error in his work?

- 1 Step 1
- 2 Step 2
- 3 Step 3
- 4 Step 4

- 90 The graph below shows \overline{AB} , which is a chord of circle O . The coordinates of the endpoints of \overline{AB} are $A(3,3)$ and $B(3,-7)$. The distance from the midpoint of \overline{AB} to the center of circle O is 2 units.



What could be a correct equation for circle O ?

- 1 $(x - 1)^2 + (y + 2)^2 = 29$
- 2 $(x + 5)^2 + (y - 2)^2 = 29$
- 3 $(x - 1)^2 + (y - 2)^2 = 25$
- 4 $(x - 5)^2 + (y + 2)^2 = 25$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(-5)^2 + (12)^2}$$

$$= \sqrt{25 + 144}$$

$$= \sqrt{169} = 13$$

radius

$$(x - 0)^2 + (y - 0)^2$$

$$x^2 + y^2 = 169$$

- 91 The equation of a circle is $x^2 + y^2 - 6y + 1 = 0$. What are the coordinates of the center and the length of the radius of this circle?

- 1 center $(0,3)$ and radius $= 2\sqrt{2}$
- 2 center $(0,-3)$ and radius $= 2\sqrt{2}$
- 3 center $(0,6)$ and radius $= \sqrt{35}$
- 4 center $(0,-6)$ and radius $= \sqrt{35}$

G.GPE.B.4: CIRCLES IN THE COORDINATE PLANE

- 92 The center of circle Q has coordinates $(3,-2)$. If circle Q passes through $R(7,1)$, what is the length of its diameter?

- 1 50
- 2 25
- 3 10
- 4 5

- 93 A circle has a center at $(1,-2)$ and radius of 4. Does the point $(3.4, 1.2)$ lie on the circle? Justify your answer.

$(0,0)$

- 94 A circle whose center is the origin passes through the point $(-5, 12)$. Which point also lies on this circle?

- 1 $(10,3)$
- 2 $(-12,13)$
- 3 $(11, 2\sqrt{12})$
- 4 $(-8, 5\sqrt{21})$

1 $(10)^2 + (3)^2 = 109$ X

2 $(-12)^2 + (13)^2 =$ X

3 $(11)^2 + (2\sqrt{12})^2 = 169$ ✓