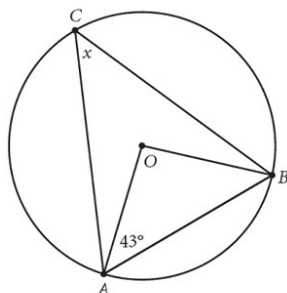


LESSON

9.3

Arcs and Angles

Closing Question

Given Circle O. Find x .

LESSON

9.3

Arcs and Angles

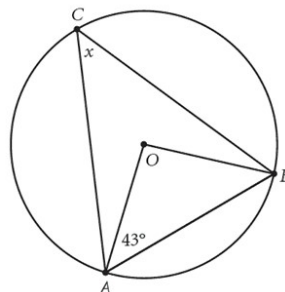
Closing Question

ANSWER

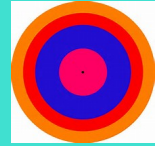
Given Circle O. Find x .

$$x = 47^\circ$$

No Homework

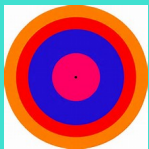


Day 2:



Please take out your graph paper with the four completed constructions from yesterday.

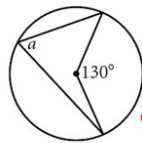
You will be working with your group to complete the problems in the packet.



9.3 Exercises
pages 468 – 470

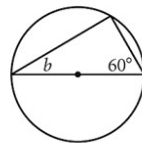
Use your new conjectures to solve Exercises 1–17. For each exercise, explain how you determined your answer.

1. $a = ?$



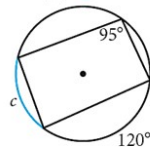
$a = 65^\circ$

2. $b = ?$



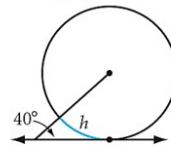
$b = 30^\circ$

3. $c = ?$ (h)



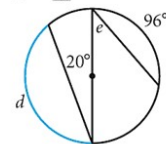
$c = 70^\circ$

4. $h = ?$ (h)



$h = 50^\circ$

5. $d = ?$
 $e = ?$

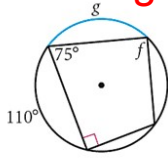


$d = 140^\circ$

$e = 42^\circ$

9.3 Exercises
pages 468 – 470

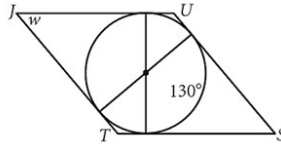
6. $f = ?$
 $g = ?$



$f = 90^\circ$

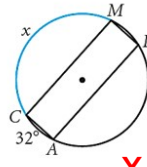
$g = 100^\circ$

7. *JUST* is a rhombus.
 $w = ?$



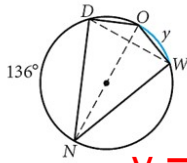
$w = 50^\circ$

8. *CALM* is a rectangle.
 $x = ?$



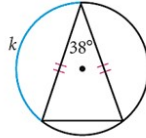
$x = 148^\circ$

9. *DOWN* is a kite.
 $y = ?$



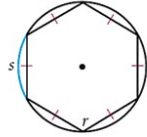
$y = 44^\circ$

10. $k = ?$



$k = 142^\circ$

11. $r = ?$
 $s = ?$

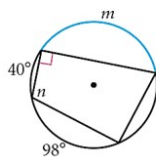


$r = 120^\circ$

$s = 60^\circ$

9.3 Exercises
pages 468 – 470

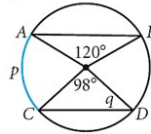
12. $m = ?$
 $n = ?$



$m = 140^\circ$

$n = 111^\circ$

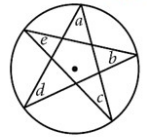
13. $\overline{AB} \parallel \overline{CD}$
 $p = ?$
 $q = ?$



$p = 71^\circ$

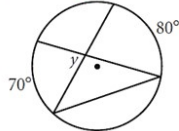
$q = 41^\circ$

14. What is the sum of a , b , c , d , and e ? (h)



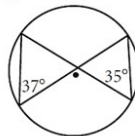
180°

15. $y = ?$ (h)



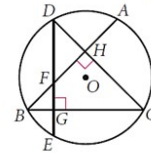
$y = 75^\circ$

16. What's wrong with this picture?



The angles should be congruent.

17. Is $\widehat{AC} \cong \widehat{CE}$? Explain.



Yes.

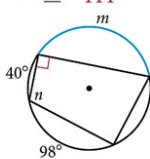
9.3 Exercises
pages 468 – 470

18. What is the difference between “an angle inscribed in an arc” and “an angle that intercepts an arc”? Draw and label an example of each.
19. How can you find the center of a circle, using only the corner of a piece of paper?
20. Chris Chisholm, a high school student in Whitmore, California, used the Angles Inscribed in a Semicircle Conjecture to discover a simpler way to find the orthocenter in a triangle. Chris constructs a circle using one of the sides of the triangle as the diameter, then immediately finds an altitude to each of the triangle’s other two sides. Use geometry software and Chris’s method to find the orthocenter of a triangle. Does this method work on all kinds of triangles? **(h)**

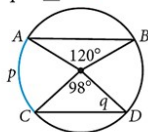
ANSWERS

9.3 Exercises

12. $m = ?$ 140°
 $n = ?$ 111°



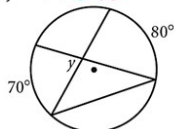
13. $\overline{AB} \parallel \overline{CD}$
 $p = ?$ 71°
 $q = ?$ 41°



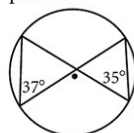
14. What is the sum of a , b , c , d , and e ? **(h)** 180°



15. $y = ?$ **(h)** 75°

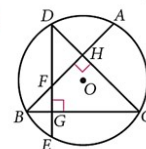


16. What’s wrong with this picture?



The two inscribed angles intercept the same arc, so they should be congruent.

17. Is $\widehat{AC} \cong \widehat{CE}$? Explain.

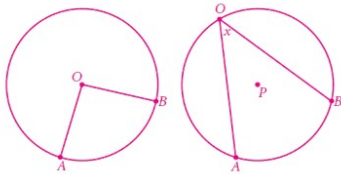


$\angle BFE \cong \angle DFA$
(Vertical Angles Conjecture).
 $\angle BGD \cong \angle FHD$
(all right angles congruent).
Therefore, $\angle B \cong \angle D$
(Third Angle Conjecture).
 $m\angle B = \frac{1}{2}m\widehat{AC}$
 $m\angle D = \frac{1}{2}m\widehat{EC}$
 $\widehat{AC} \cong \widehat{EC}$

ANSWERS

9.3 Exercises

18. An inscribed angle is an angle with its vertex on the circle, formed by intersecting chords. An angle that intercepts an arc could be an inscribed angle formed by two chords, an angle formed by a tangent and a chord, a central angle formed by two radii, angles formed by intersecting chords, or angles formed by tangents and secants. Possible examples: Circle O has central angle AOB which intercepts arc AB . Circle P has inscribed angle AOB which intercepts arc AB .

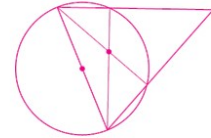


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- 18. What is the difference between “an angle inscribed in an arc” and “an angle that intercepts an arc”? Draw and label an example of each.
- 19. How can you find the center of a circle, using only the corner of a piece of paper?
- 20. Chris Chisholm, a high school student in Whitmore, California, used the Angles Inscribed in a Semicircle Conjecture to discover a simpler way to find the orthocenter in a triangle. Chris constructs a circle using one of the sides of the triangle as the diameter, then immediately finds an altitude to each of the triangle’s other two sides. Use geometry software and Chris’s method to find the orthocenter of a triangle. Does this method work on all kinds of triangles?

19. Possible answer: Place the corner so that it is an inscribed angle. Trace the inscribed angle. Use the side of the paper to construct the hypotenuse of the right triangle (which is the diameter). Repeat the process. The place where the two diameters intersect is the center.

20. possible answer:



It works on acute and right triangles.

Lesson 9.3 Arc and Angles

Homework:
Workbook page 67

