

SECONDARY MATH II // MODULE 7
 CIRCLES: A GEOMETRIC PERSPECTIVE - 7.6



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7.6 Circular Reasoning

A Practice Understanding Task

The following problems will draw upon your knowledge of similarity, circle relationships and trigonometry.

In the following diagram the radius of $\odot D$ is 5 cm and F is the midpoint of \overline{AE} . The measures of arc EB and arc BC are given in the diagram. Find the measures of all other unmarked angles, arcs and segments.

$m\widehat{EB} = 40^\circ$
 $m\widehat{BC} = 60^\circ$
 $m\angle EGA = \frac{1}{2}(m\widehat{EBA} - m\widehat{AE}) = \frac{1}{2}(180 - 40) = 70$
 $m\angle EGA = \frac{1}{2}(220 - 140) = 40$
 $m\angle EGA = 40^\circ$
 Tangent lines to $\odot D$:
 \overline{GE} & \overline{GA}

$m\widehat{AE} = 180 - 40 = 140^\circ$
 $m\angle BCA = \frac{1}{2} \cdot 180 = 90^\circ$
 $m\angle ACB = 90^\circ$
 $m\widehat{AC} = 180 - 60 = 120^\circ$
 $m\widehat{AC} = 120^\circ$

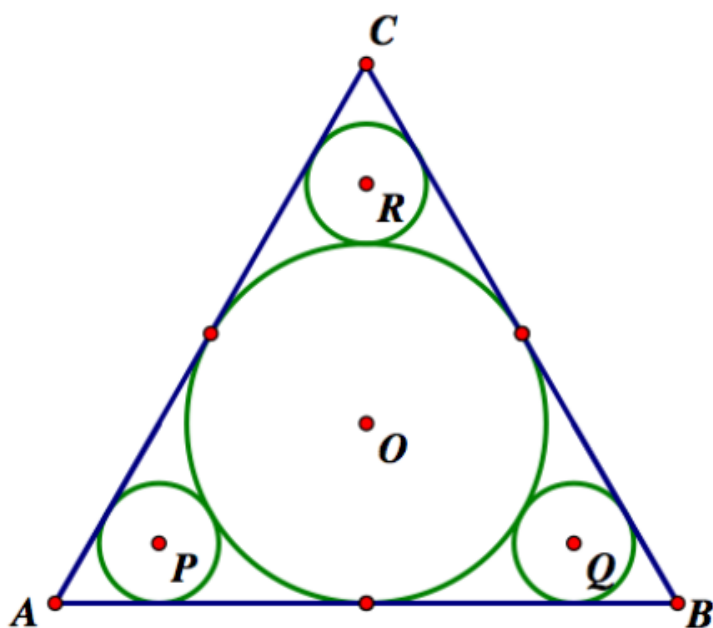
$\triangle ABC$
 SOH
 $10 \sin 60 = \frac{b}{10}$
 $10 \cdot \sin 60 = b$
 $8.7 = b$

$\triangle AFD$
 CAH
 $5 \cdot \cos 20 = \frac{y}{5}$
 $5 \cdot \cos 20 = y$
 $4.7 = y$

$\triangle AFD$
 SOH
 $5 \cdot \sin 20 = \frac{x}{5}$
 $5 \cdot \sin 20 = x$
 $1.7 = x$

2. In the diagram below $\triangle ABC$ is equilateral. All circles are tangent to each other and to the sides of the equilateral triangle. The radius of the three smaller circles, $\odot P$, $\odot Q$ and $\odot R$, is 4 cm. The radius of $\odot O$ is not given.

- Find the radius of $\odot O$ and the length of the sides of the equilateral triangle.



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7.6

READY, SET, GO!

Name

Period

Date

READY

Topic: Measurement conversion and scaling

Many times items we are interested in measuring or keeping track of in some way are tracked in a unit of measure that we need to change.

Below you will find several measurements, convert them all to the units of feet.

(1 foot = 12 inches, 1 yard = 3 feet, 1 mile = 5280 feet)

- | | | |
|--------------|--------------|---------------|
| 1. 50 inches | 2. 2.5 yards | 3. 133 inches |
| 4. 7 yards | 5. 2 miles | 6. 8 inches |

The equation $C = \frac{5}{9}(F - 32)$ will convert temperatures measured in Fahrenheit to the unit of Celsius measurement.

Use this equation to convert the given temperatures.

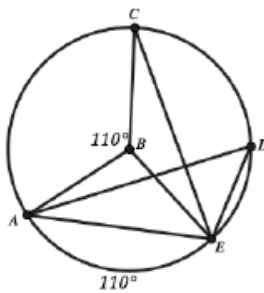
- | | | |
|----------|----------|----------|
| 7. 50°F | 8. 98°F | 9. 32°F |
| 10. 20°C | 11. 85°C | 12. 42°C |

SET

Topic: Arc Length, Arc Measure, Central and Inscribed Angles

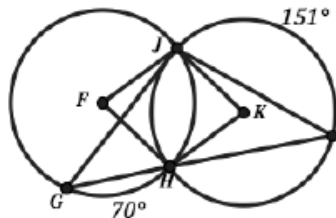
Use the figure below and the givens to find all angle measures and arc measures possible.

13.



- $m\widehat{AC} =$
- $m\angle ABE =$
- $m\angle CBE =$
- $m\angle ADE =$
- $m\widehat{CDE} =$
- $m\angle BAE =$
- $m\angle BEA =$
- $m\angle BCE =$
- $m\angle BEC =$

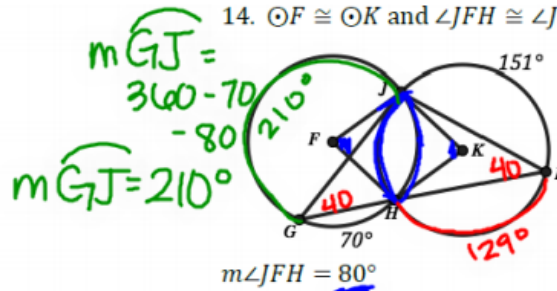
14. $\odot F \cong \odot K$ and $\angle JFH \cong \angle JKH$



$m\angle JFH = 80^\circ$

- $m\widehat{JI} = 80$
- $m\angle FJK = 100$
- $m\angle FHK = 100$
- $m\angle JGH = 40$
- $m\widehat{JG} = 210$
- $m\angle JIH = 40$
- $m\angle GJI = 100$
- $m\widehat{HI} = 129$

14. $\odot F \cong \odot K$ and $\angle JFH \cong \angle JKH$



$m\widehat{GJ} =$
 $360 - 70$
 $- 80$
 $m\widehat{GJ} = 210^\circ$

$m\widehat{HI} = 360 -$
 $151 -$
 80
 $m\widehat{HI} = 129^\circ$

15. In the figure below. Given that $\triangle JKL$ is an equilateral triangle. List all of the angle and arc measurements that you will know for sure as a result of this given item.

Angles that = 60°

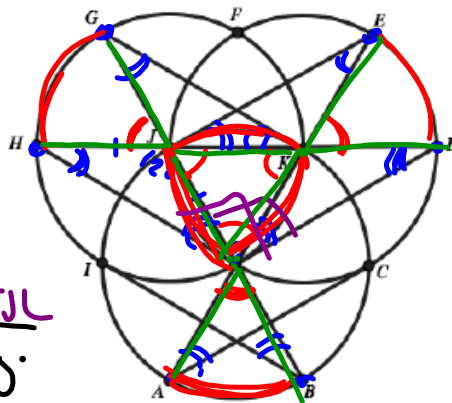
$\angle LJK$ $\angle LKJ$ $\angle JKL$
 $\angle HJG$ $\angle EKJ$ $\angle ALB$

Angles that = 90°

$\angle JLD$ $\angle HJK$ $\angle GKT$ $\angle EIL$

Angles that = 30°

$\angle H$ $\angle G$ $\angle E$ $\angle D$ $\angle B$ $\angle A$ $\angle HLJ$...



Arcs that = 60°

\widehat{ED} \widehat{GH} \widehat{AB}
 \widehat{LR} \widehat{KJ} \widehat{JL}

16. In the figure above. Given that $\triangle JKL$ is an equilateral triangle and each side is 5 units of length. List all of the segment and arc length measurements that you will know for sure as a result of this given information.

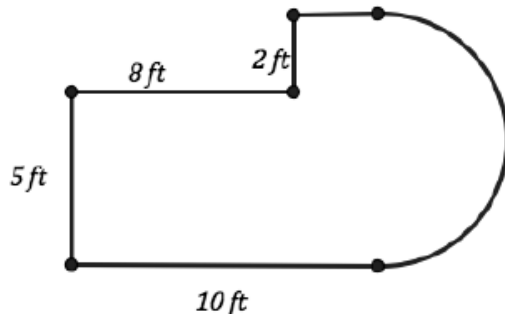
5 units: \overline{HJ} , \overline{GJ} , ...

GO

Topic: Area and distance for composed figures

Find the area and perimeter for each of the figures below.

17.



18.

X Not 56.845!

