

SECONDARY MATH II// MODULE 7

CIRCLES: A GEOMETRIC PERSPECTIVE - 7.7

## 7.7 Pied!

### *A Develop Understanding Task*



Students have planned several activities to celebrate Pi Day at their school. In addition to pie eating contests and “pie-ing” their favorite teachers, the Math Club plans to make money by selling slices of pie during lunch hour. Each member of the club has contributed a couple of homemade pies for the sale. Unfortunately, the members chose a variety of sizes and shapes of pans to bake their pies in. Some students used 9-inch round pans for their pies, others used 8-inch round pans, a few used 8-by-8 inch square pans, and one student used a 9-by-13 inch cake pan for his pie. Now the club members have the dilemma of how to slice the pies so each slice is about the same amount, since they plan to charge the same amount for each slice of pie regardless of the pan it came from.

After much debate, the club members have decided to slice the 8-inch round pies into 5 equal slices (or *sectors* as the math geeks call them), the 9-inch round pies into 6 equal slices, the 8-by-8 inch pies into 2-by-4 inch rectangles, and the 9-by-13 inch pie into 3-by-3  $\frac{1}{4}$  inch rectangles.

Although the pieces look like they are all about the same size, some students think there might be a price advantage in buying one type of slice over another.

1. Which slice of pie is the largest and which is the smallest? How did you decide?

Unfortunately, not everyone in the math club is good at eye-balling equal size *sectors* when cutting round pies. Therefore, one of the students is assigned to be in charge of “quality control”. He is given a protractor and is told to reject any slices of pie that are more or less than  $4^\circ$  from the exact angle measurement.

2. Using this criteria, what is the smallest and largest amount of pie you might get in a slice of pie taken from the 8-inch pan?
  
  
  
  
  
  
  
  
  
  
3. Using this criteria, what is the smallest and largest amount of pie you might get in a slice of pie taken from the 9-inch pan?

The student in charge of quality control finds it is too difficult to measure the angle of a sector of pie in degrees, and suggest that they cut a piece of string that could be used to measure around the outer edge of the pie to let the servers know where to make the next cut.

4. How long should this string be to measure the arc of a slice of pie for the 8-inch round pies?

5. How long should this string be to measure the arc of a slice of pie for the 9-inch round pies?



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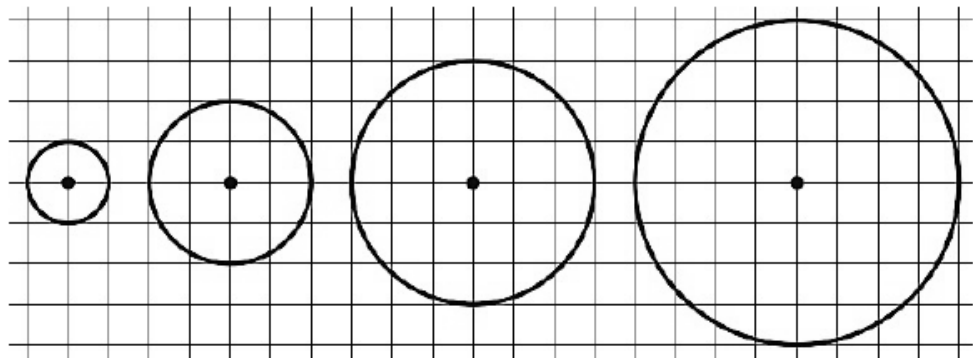
7.7

READY, SET, GO!	Name	Period	Date
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**READY**

Topic: Circumference, ratios

1. There are four circles below each with a different radius. Determine the circumference and area of each and look for any patterns. What do you notice?



	Radius = 1	Radius = 2	Radius = 3	Radius = 4
Circumference				
Area				

*A ratio is a comparison between two quantities. Trigonometric ratios of sine, cosine and tangent are ratios between sides in a right triangle. We can make ratios between many different quantities.*

**Write ratios for the indicated quantities below.**

2. The ratio of boys to girls in our math class.

3. The ratio of girls to boys in your family.

4. The ratio bathrooms to bedrooms in your house.

5. The ratio of televisions to people that live in your house.

6. The ratio of people in your house to cell phones in your house.

**SET**

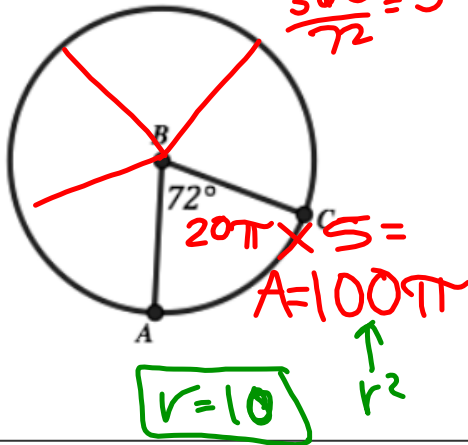
Topic: Circumference and area of circles and sectors of circles

Use the given information to determine the desired item.

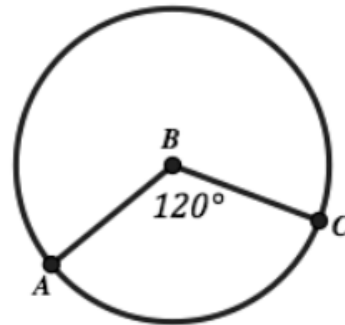
7. The area of the circle is  $25\pi$  cm<sup>2</sup>.  
What is the circumference of the circle?

8. The circumference of the circle is  $10\pi$  feet.  
What is the area of the circle?

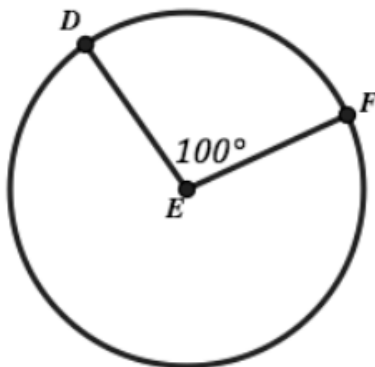
9. The area of the small sector is  $20\pi$  ft<sup>2</sup>.  
What is the radius of the circle?



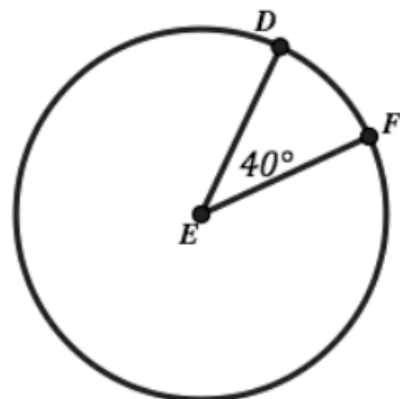
10. The arc length of arc AC measures  $16\pi$  cm.  
What is the area of the circle?



11. The arc length of arc DF measures 30 m.  
What is the area of the circle?



12. The area of the small sector is  $\pi$  in<sup>2</sup>.  
What is the circumference of the circle?

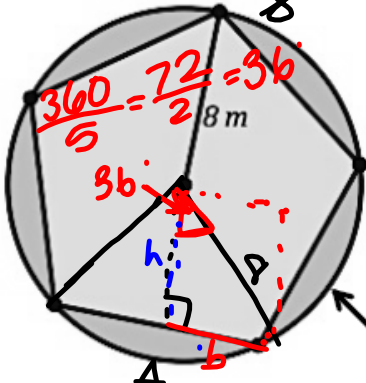


GO

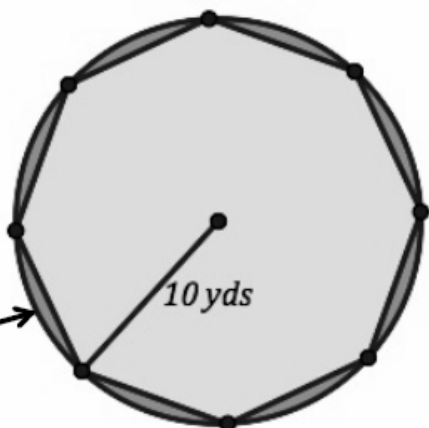
Topic: Finding area and decomposing area

Find the area of the darkest shaded region in each figure below.

$b: 8 \cdot \sin 36 = \frac{b}{8} = 4.7$   
 $h: 8 \cdot \cos 36 = \frac{h}{8} = 6.47$

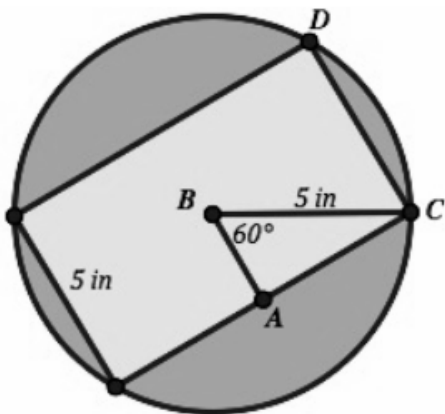


14.



$A_0 - A_1$   
 $\pi 8^2 - (4.7 \times 6.47) 5$   
 $201.06 - 152.64 =$   
 $49.02 m^2$

15.



16.

