The Radian Sector

TheRadianSector.tns

Name _____

Class _____

Problem 1 – Concentric Circles

1. Complete the following table at four different values of θ on page 1.2. (Move point *P* to change the value of θ.)

Position	θ	Arc Length 1	$\frac{\text{Arc Length 1}}{\text{Radius 1}}$	Arc Length 2	$\frac{\text{Arc Length 2}}{\text{Radius 2}}$
1					
2					
3					
4					

2. What patterns do you notice from the table above?

3. Does a central angle exist where arc length 1 = arc length 2?

4. For what central angle is $\frac{\text{arc length 1}}{\text{radius 1}} = \frac{\text{arc length 2}}{\text{radius 2}}$?

Problem 2 – Random Circles

5. Complete the following table for four different values of θ and four random circles on page 2.2. (Move point *P* to change the value of θ. Click the slider for Random for a new Radius.)

Position	θ	Radius 1	Arc Length 1	$\frac{\text{Arc Length 1}}{\text{Radius 1}}$	Arc Length 2	$\frac{\text{Arc Length 2}}{\text{Radius 2}}$
1						
2						
3						
4						

6. What patterns do you notice from the table above?

7. When radius 1 ≠ radius 2, does a central angle exist where arc length 1 = arc length 2?

8. For what central angle is $\frac{\text{arc length 1}}{\text{radius 1}} = \frac{\text{arc length 2}}{\text{radius 2}}$?

9. Convert the four values of your central angle from the table in Question 5 into radians rounded to two decimal places. (i.e., $35^o = 35^o(\pi/180^o) \approx 0.61$)

10. The values of $\frac{\text{arc length 1}}{\text{radius 1}}$ and $\frac{\text{arc length 2}}{\text{radius 2}}$ are equal for all central angles and all radii. These two values are therefore proportional. What is the approximate constant of proportionality?

Problem 3 – Arc Length

11. What is the formula for the circumference of a circle?

12. What is the circumference of the circle on page 3.2?

13. What percentage of the circumference is the arc length for a central angle of 90^o?

14. Explain how to find what percentage of the circumference is an arc length when given the central angle.

15. What is the formula for the arc length of a sector with central angle θ (in degrees) and radius ***r***?

Problem 4 – Sector Area

16. What is the formula for the Sector Area with central angle θ (in degrees) and radius ***r***?