## Unit 7 Lesson 8: Arcs and Sectors

### 1 Math Talk: Fractions of a Circle (Warm up)

#### Student Task Statement

Evaluate each problem mentally.

* Find the area of the shaded portion of the circle.
* 
* Find the length of the highlighted portion of the circle’s circumference.
* 
* Find the area of the shaded portion of the circle.
* 
* Find the length of the highlighted portion of the circle’s circumference.
* 

### 2 Sector Areas and Arc Lengths

#### Student Task Statement

A **sector** of a circle is the region enclosed by 2 radii.

A



B



C



For each circle, find the area of the shaded sector and the length of the arc that outlines the sector. All units are centimeters. Give your answers in terms of $π$.

#### Activity Synthesis





### 3 Build a Method

#### Student Task Statement

Mai says, “I know how to find the area of a sector or the length of an arc for central angles like 180 degrees or 90 degrees. But I don’t know how to do it for central angles that make up more complicated fractions of the circle.”

1. In the diagram, the sector’s central angle measures $θ$ degrees and the circle’s radius is $r$ units. Use the diagram to tell Mai how to find the *area of a sector* and the *length of an arc* for any angle and radius measure.
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1. This image shows a circle with radius and central angle measurements. Find the area of the shaded sector, and the length of the arc defined by the sector.
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#### Images for Activity Synthesis





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