

Geometry · Arc Length, Sector Area and Radians · Worksheet

Common Core G-C.B.5 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

These 25 problems practice standard G-C.B.5: finding arc lengths and sector areas as fractions of a circle, working with radian measure, and converting between degrees and radians. They move from simple fractions of a circle to word problems about pizza, sprinklers and Ferris wheels.

Show the fraction of the circle first, keep answers exact in terms of π , and round only when the problem says so.

GeometryCommon Core: G-C.B.5

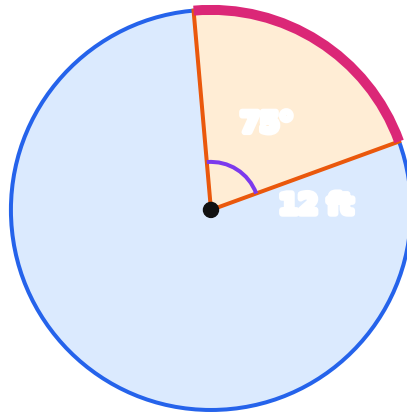
Problem 1: Fraction of a circle

A central angle measures 150° . Write the fraction of the circumference that its arc represents, in lowest terms.

Problem 2: Quarter-circle arc

A circle has radius 14 yd. Find the length of the arc cut off by a central angle of 90° . Give the exact length and a decimal rounded to the nearest hundredth.

Problem 3: Arc length of a sector



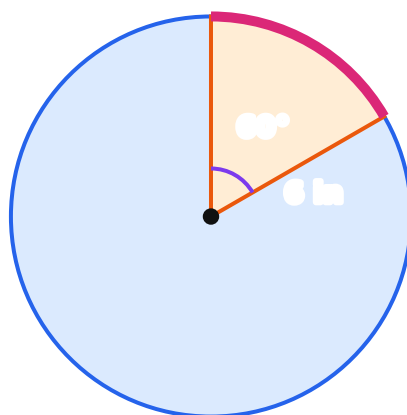
Sector with radius 12 ft and central angle 75 degrees.

Find the arc length of the sector shown. Give the exact value and a decimal rounded to the nearest hundredth.

Problem 4: Arc with an obtuse angle

A circle has radius 10 in. Find the length of the arc intercepted by a central angle of 135° . Give the exact length and a decimal rounded to the nearest hundredth.

Problem 5: Area of a sector



Sector with radius 6 in and central angle 60 degrees.

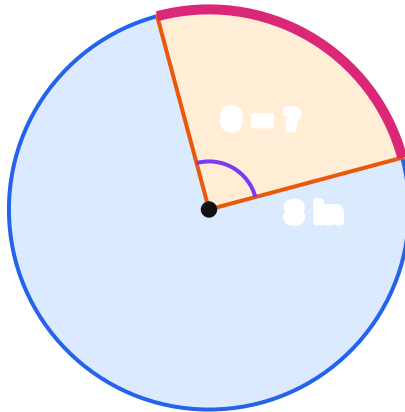
Find the area of the shaded sector. Give the exact area and a decimal rounded to the nearest

hundredth.

Problem 6: Area with an obtuse angle

Find the area of a sector with radius 10 in and central angle 135° . Give the exact area and a decimal rounded to the nearest hundredth.

Problem 7: Central angle from arc length



Arc length $4\pi\text{ in}$ on a circle of radius 8 in .

The arc shown has length $4\pi\text{ in}$ on a circle of radius 8 in . Find the central angle in degrees.

Problem 8: Radius from arc length

An arc with central angle 72° has length $6\pi\text{ cm}$. Find the radius of the circle.

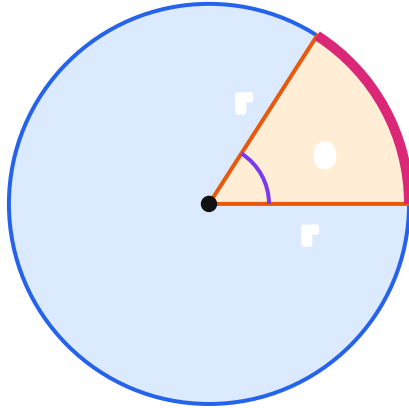
Problem 9: Radius from sector area

A sector with central angle 120° has area $12\pi\text{ ft}^2$. Find the radius.

Problem 10: Central angle from sector area

A sector of a circle with radius 5 in has area $5\pi\text{ in}^2$. Find the central angle in degrees.

Problem 11: Meaning of a radian



An arc three times as long as the radius.

On a circle with radius 5 cm , a central angle intercepts an arc of length 15 cm . Find the measure of the angle in radians.

Problem 12: Radians from arc and radius

A circle has radius 4 in . A central angle intercepts an arc 10 in long. Find the angle in radians.

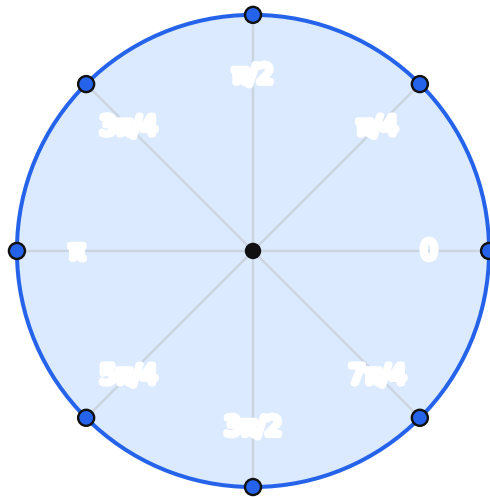
Problem 13: Degrees to radians

Convert 150° to radians. Give the answer in terms of π .

Problem 14: Reflex angle in radians

Convert 225° to radians. Give the answer in terms of π .

Problem 15: Radians to degrees



Multiples of 45 degrees.

Convert $\frac{7\pi}{6}$ radians to degrees.

Problem 16: Radians to degrees, again

Convert $\frac{5\pi}{3}$ radians to degrees.

Problem 17: A radian without pi

Convert 2 radians to degrees. Round to the nearest hundredth of a degree.

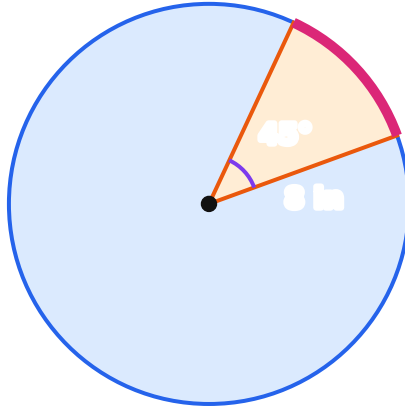
Problem 18: Arc length with radians

A central angle of $\frac{\pi}{3}$ radians is drawn in a circle of radius 7 in. Find the arc length. Give the exact value and a decimal rounded to the nearest hundredth.

Problem 19: Sector area with radians

A sector has radius 6 ft and central angle $\frac{\pi}{4}$ radians. Find its area. Give the exact value and a decimal rounded to the nearest hundredth.

Problem 20: Pizza slice



One slice of a 16-inch pizza.

Jamal cuts a 16-inch pizza into 8 equal slices. Find (a) the length of the crust on one slice and (b) the area of one slice. Give decimals rounded to the nearest hundredth.

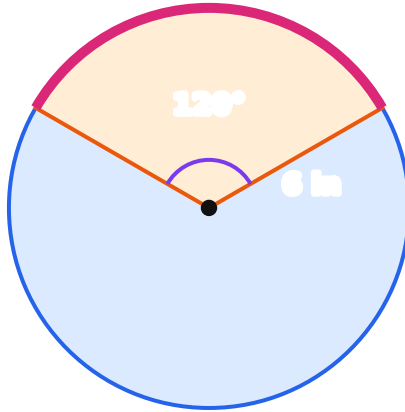
Problem 21: Lawn sprinkler

A sprinkler at the edge of a lawn sprays water up to 25 ft away and turns back and forth through an angle of 80° . Find the area of grass it waters. Round to the nearest square foot.

Problem 22: Running the curve

Maya runs along a circular track of radius 30 yd. She starts at one point and stops after covering a central angle of 200° . How far does she run? Round to the nearest tenth of a yard.

Problem 23: Clock hand



The minute hand sweeps from 12 to 4 in 20 minutes.

A minute hand is 6 in long. In 20 minutes it turns through 120° . How far does its tip travel? Give the exact distance and a decimal rounded to the nearest hundredth.

Problem 24: Pie chart slice

In a pie chart of radius 5 in, the slice for the school store covers 30% of the circle. Find (a) the central angle of the slice, (b) the length of its curved edge and (c) its area. Give decimals rounded to the nearest hundredth.

Problem 25: Ferris wheel

A Ferris wheel at a county fair has radius 40 ft. A rider travels 100 ft along the circle. Find the angle the rider turns through (a) in radians and (b) in degrees, rounded to the nearest hundredth.