LESSON MAKER PRO

Circle Slice Skills

Use central angles to find arc lengths and sector areas.

HIGH SCHOOL · HSG-C.B

CCSS.Math.Content.HSG-C.B "Find arc lengths and areas of sectors of circles"

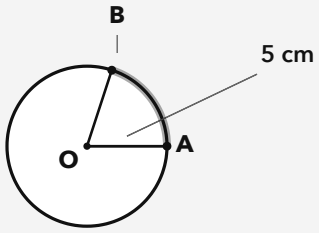
NAME _____ DATE _____

PARTS OF A CIRCLE

A central angle cuts out the same fraction of a circle as it does of the full 360°. Find that fraction, then multiply by the whole circumference for arc length or by the whole circle area for sector area.

WORKED EXAMPLE

A circle has radius 5 cm and central angle AOB=72°. Find the area of the minor sector bounded by OA, OB and the highlighted arc AB.

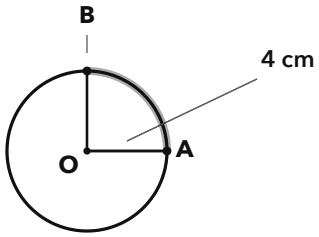


1. The sector is 72/360 = 1/5 of the circle.
2. The area of the full circle is $\pi(5)^2 = 25\pi$ cm^2.
3. Multiply: $1/5 \times 25\pi = 5\pi$ cm^2.

Answer: 5π cm^2

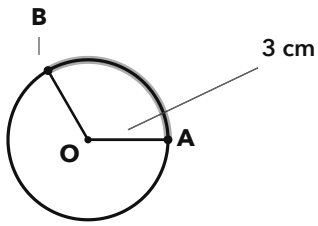
PRACTICE 6 problems

1 A circle has radius 4 cm and central angle AOB=90°. Find the length of the highlighted minor arc AB.



ANSWER _____

2 A circle has radius 3 cm and central angle AOB=120°. Find the area of the minor sector bounded by OA, OB and the highlighted arc AB.



ANSWER _____

3 A circle has radius 7 cm. Find the length of an arc with a central angle of 180°.

ANSWER _____

4 Find the area of a sector with radius 6 cm and central angle 150°.

ANSWER _____

5 A circle has radius 12 cm. An arc is 8π cm long. Find the measure of its central angle.

ANSWER _____

6 A sector has area 16π cm^2 and radius 8 cm. Find the measure of its central angle.

ANSWER _____

APPLY IT Show your work

1 An esports club is printing a circular logo. A 144° fan-shaped section of the logo, with radius 10 cm, will use metallic ink. What area will use metallic ink?

WORK SPACE

ANSWER _____

2 On a skatepark design, a curved rail follows an arc of a circle with radius 9 ft and central angle 160°. How long is the curved rail?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A circular album cover has radius 12 cm. Sector B has three times the area of Sector A. Sector A has a central angle of 75°. Find the arc length of Sector B. Explain why you can use the area comparison to find Sector B's central angle.

WORK SPACE AND ANSWER

ANSWER KEY

Circle Slice Skills

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A circle has radius 4 cm and central angle AOB=90°. Find the length of the highlighted minor arc AB.	**2π cm**
2	A circle has radius 3 cm and central angle AOB=120°. Find the area of the minor sector bounded by OA, OB and the highlighted arc AB.	**3π cm^2**
3	A circle has radius 7 cm. Find the length of an arc with a central angle of 180°.	**7π cm**
4	Find the area of a sector with radius 6 cm and central angle 150°.	**15π cm^2**
5	A circle has radius 12 cm. An arc is 8π cm long. Find the measure of its central angle.	**120°**
6	A sector has area 16π cm^2 and radius 8 cm. Find the measure of its central angle.	**90°**

PART 2 · APPLY IT

1. **40π cm^2** The section is 144/360 = 2/5 of the logo. Multiply 2/5 by π(10)^2 to get 40π cm^2.
2. **8π ft** The arc is 160/360 = 4/9 of the full circumference. Multiply 4/9 by 2π(9) to get 8π ft.

CHALLENGE

15π cm. Sector B has three times the area, so it has three times the central angle: 3 × 75° = 225°. Its arc length is 225/360 × 2π(12) = 15π cm.

Accept equivalent exact forms, such as 40π or (2/5)(100π), when they are simplified correctly. For the challenge, accept reasoning that sectors in the same circle have areas proportional to their central angles.