LESSON MAKER PRO

# Circle Design Lab

*Measure borders and spaces inside circles.*

**GRADE 7 · 7.GM.3.3**

**7.GM.3.3** "Calculate the circumference and area of circles to solve problems in various contexts, in terms of pi (π) and using approximations for pi (π)."

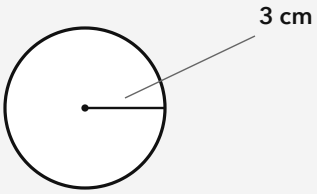
NAME _____ DATE _____

## AROUND AND INSIDE

Circumference is the distance around a circle: $C = \pi d = 2\pi r$. Area is the space inside a circle: $A = \pi r^2$. The radius is half the diameter; use 3.14 for π when you need a decimal answer.

### WORKED EXAMPLE

Find the circumference and area of the circle shown, first in terms of π, then using 3.14 for π.

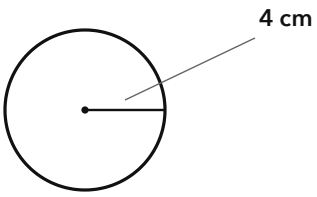



1. $C = 2\pi r = 2\pi(3) = 6\pi$ cm.
2. $C \approx 6(3.14) = 18.84$ cm.
3. $A = \pi r^2 = \pi(3^2) = 9\pi$ cm$^2$.
4. $A \approx 9(3.14) = 28.26$ cm$^2$.

**Answer: Circumference: 6π cm, or about 18.84 cm. Area: 9π cm$^2$, or about 28.26 cm$^2$.**

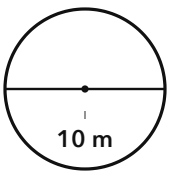
## PRACTICE 6 problems

**1** Find the circumference of the circle shown in terms of π.



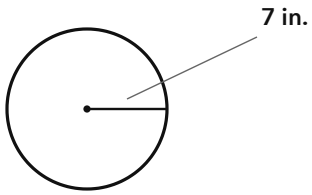

ANSWER _____

**2** Find the area of the circle shown in terms of π.



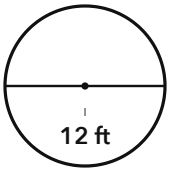

ANSWER _____

**3** Find the circumference of the circle shown. Use 3.14 for π.



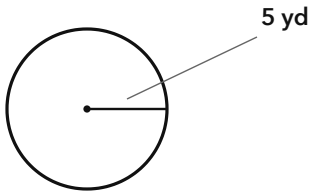

**ANSWER** _____

**4** Find the area of the circle shown. Use 3.14 for π.




**ANSWER** _____

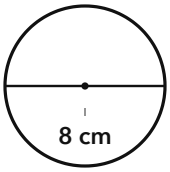
**5** Find both the circumference and the area of the circle shown in terms of π.




**ANSWER** _____

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**6** Find both the circumference and the area of the circle shown. Use 3.14 for π.

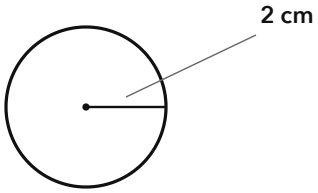



**ANSWER** _____

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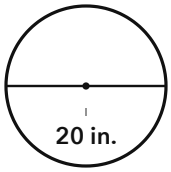
## APPLY IT Show your work

**1** You add a border to each of 5 round laptop stickers like the one shown. How many centimeters of border do you need in all? Use 3.14 for π.




**ANSWER** _____

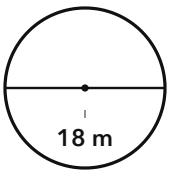
**2** A gaming club makes the round tabletop mat shown. How many square inches of fabric does one mat need? Give the area in terms of π and using 3.14 for π.




**ANSWER** _____

## CHALLENGE One step up

A club plans the circular game zone shown. Boundary tape costs $2 per meter, and floor covering costs $1 per square meter. Which costs more, tape or covering? By how much? Use 3.14 for π.




WORK SPACE AND ANSWER

ANSWER KEY

# Circle Design Lab

GRADE 7 · 7.GM.3.3

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Find the circumference of the circle shown in terms of π. | **8π cm** |
| 2 | Find the area of the circle shown in terms of π. | **25π $m^2$** |
| 3 | Find the circumference of the circle shown. Use 3.14 for π. | **43.96 in.** |
| 4 | Find the area of the circle shown. Use 3.14 for π. | **113.04 $ft^2$** |
| 5 | Find both the circumference and the area of the circle shown in terms of π. | **Circumference: 10π yd. Area: 25π $yd^2$.** |
| 6 | Find both the circumference and the area of the circle shown. Use 3.14 for π. | **Circumference: 25.12 cm. Area: 50.24 $cm^2$.** |

## PART 2 · APPLY IT

1. **62.8 cm** Each sticker needs 2(3.14)(2) = 12.56 cm of border. For 5 stickers, 5(12.56) = 62.8 cm.
2. **100π $in.^2$, or 314 $in.^2$** The radius is 10 in. The area is π($10^2$) = 100π $in.^2$, or 314 $in.^2$ using 3.14 for π.

## CHALLENGE

**Floor covering costs $141.30 more. Tape costs 18(3.14)($2) = $113.04. Covering costs $9^2$(3.14)($1) = $254.34. The difference is $254.34 − $113.04 = $141.30.**

Accept equivalent forms of exact answers. Decimal answers use 3.14 for π, not a calculator's π key.