

Center Court Circles

Basketball and hockey seasons are rolling, and both games are full of circles: center circles, rims, pucks and faceoff circles. Use real rulebook sizes to find radius, diameter, circumference and area. Every team and player on this sheet is made up.

Name _____

Date _____

CIRCLE TOOLKIT

$$d = 2r$$

diameter is
twice the radius

$$C = \pi d$$

circumference
from diameter

$$C = 2\pi r$$

circumference
from radius

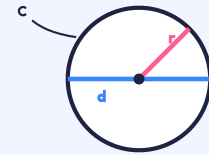
$$A = \pi r^2$$

area: square the
radius first

$$\pi \approx 3.14$$

use this value
on every problem

PARTS OF A CIRCLE



RADIUS • DIAMETER • CIRCUMFERENCE

REAL GAME MEASUREMENTS

NBA CENTER CIRCLE

radius 6 ft

BASKETBALL RIM

diameter 18 in

HOCKEY PUCK

diameter 3 in

NHL FACEOFF CIRCLE

radius 15 ft

SOCCER CENTER CIRCLE

radius 10 yd

These are the real sizes from the rulebooks. Watch the units: feet, inches and yards stay as given.

ROOKIE

- 1 The center circle on a basketball court has a **radius of 6 feet**. What is its **diameter**?

WORK SPACE

_____ ft

ROOKIE

- 2 Find the **circumference** of that center circle (radius 6 ft). Use $\pi \approx 3.14$.

WORK SPACE

_____ ft

STARTER

- 3 A basketball rim has a **diameter of 18 inches**. How far is it all the way around the rim?

WORK SPACE

_____ in

STARTER

- 4 Find the **area** inside the center circle (radius 6 ft).

WORK SPACE

_____ sq ft

PRO

- 5 A hockey puck is **3 inches** across. Find the area of its flat top face. Round to the nearest hundredth.

WORK SPACE

_____ sq in

PRO

- 6 A basketball has a **circumference of about 29.5 in**. Find its diameter to the nearest tenth. Could two balls fit side by side in the 18-in rim?

WORK SPACE

_____ in _____

ALL-STAR

- 7 The restricted area under the hoop is marked by a **half circle** with a 4-ft radius. How long is that curved line?

WORK SPACE

_____ ft

CHALLENGE ★

- 8 Challenge: The Lakeview Comets paint their center circle (radius 6 ft) blue. One quart of paint covers **40 sq ft**. How many quarts must they buy?

WORK SPACE

_____ quarts

A Complete the Circle Table

Each row gives one measurement. Find the other three. Round areas to the nearest hundredth and label units (area is in square units).

CIRCLE	RADIUS	DIAMETER	CIRCUMFERENCE	AREA
Soccer center circle	10 yd			
NHL faceoff circle		30 ft		
Shot put circle		7 ft		
Baseball on-deck circle			15.7 ft	

B Think Like a Coach

Multi-step problems. Show your work and use $\pi \approx 3.14$.

- 1 An NHL faceoff circle has a radius of **15 ft**. The NBA center circle has a radius of **6 ft**. The faceoff circle's radius is how many times as long? Its area is how many times as big?

WORK SPACE

radius _____ times area _____ times

- 2 During warm-ups, guard Maya Ortiz of the Lakeview Comets jogs **3 laps** around the edge of the center circle (radius 6 ft). How far does she jog?

WORK SPACE

_____ ft

- 3 A basketball (circumference 29.5 in) rolls in a straight line for **10 feet**. About how many full turns does it make? (Hint: change feet to inches first.)

WORK SPACE

_____ full turns

- 4 At center ice, a faceoff circle (radius 15 ft) has a solid center spot **1 ft across**. Find the area inside the circle but outside the spot, to the nearest hundredth.

WORK SPACE

_____ sq ft

CHALLENGE ★ EXPLAIN IT

Coach Dev Patel of the Riverside Otters says, "The rim looks tiny from the free-throw line, but it's huge compared to the ball." Use areas to check him. Find the area of the rim opening (diameter 18 in) and the area of the ball's widest slice (diameter 9.4 in, rounded to the nearest hundredth). About how many times bigger is the rim opening, to the nearest tenth? Is the coach right?

rim _____ ball _____ times _____

Answer Key (for teachers & parents)

Answers for **Center Court Circles**, using $\pi \approx 3.14$. Print pages 1 and 2 for students and keep this page for checking. Accept answers that differ slightly in the last decimal place if a student used the π key on a calculator.

Page 1 Problems

1. Answer: 12 ft

$$d = 2 \times 6 = 12$$

2. Answer: 37.68 ft

$$C = 2 \times 3.14 \times 6$$

3. Answer: 56.52 in

$$C = 3.14 \times 18$$

4. Answer: 113.04 sq ft

$$A = 3.14 \times 6^2 = 3.14 \times 36$$

5. Answer: 7.07 sq in

$$r = 1.5, A = 3.14 \times 2.25 = 7.065$$

6. Answer: 9.4 in · No

$29.5 \div 3.14 \approx 9.39$, so 9.4 in. Two balls: $2 \times 9.4 = 18.8$ in, wider than 18 in.

7. Answer: 12.56 ft

$$\text{Half of } 2 \times 3.14 \times 4 = 3.14 \times 4$$

8. Answer: 3 quarts

$$A = 113.04 \text{ sq ft. } 113.04 \div 40 = 2.826, \text{ so round up to 3.}$$

Challenge · Explain It

1. Answer: rim 254.34 sq in · ball 69.36 sq in · about 3.7 times

Rim: 3.14×9^2 · Ball: $3.14 \times 4.7^2 \approx 69.36$. $254.34 \div 69.36 \approx 3.7$, so the coach is right.

Quick score

Page 1 problems	_____ / 8
A · Circle Table	_____ / 12
B · Think Like a Coach	_____ / 4
Challenge	_____ / 2
Total	_____ / 26

Skills practiced

- Circumference
- Area of circles
- Radius & diameter
- Decimals
- Rounding
- Ratios & scale
- Multi-step problems

Teaching tip: Before computing, have students circle whether each problem asks for the distance *around* (circumference) or the space *inside* (area). Use B1 to discuss why 2.5 times the radius gives $2.5 \times 2.5 = 6.25$ times the area.

A · Circle Table

- Answer: Soccer center circle: r 10 · d 20 · C 62.8 yd · A 314 sq yd
- Answer: NHL faceoff circle: r 15 · d 30 · C 94.2 ft · A 706.5 sq ft
- Answer: Shot put circle: r 3.5 · d 7 · C 21.98 ft · A 38.47 sq ft
- Answer: Baseball on-deck circle: r 2.5 · d 5 · C 15.7 ft · A 19.63 sq ft

On-deck: $r = 15.7 \div (2 \times 3.14) = 2.5$. Shot put area 38.465 rounds to 38.47.

B · Think Like a Coach

- Answer: radius 2.5 times · area 6.25 times
 $706.5 \div 113.04 = 6.25$, which is 2.5^2 .
- Answer: 113.04 ft
 3×37.68
- Answer: 4 full turns
 $10 \text{ ft} = 120 \text{ in. } 120 \div 29.5 \approx 4.07$.
- Answer: 705.72 sq ft
 $706.5 - 3.14 \times 0.5^2 = 706.5 - 0.785 = 705.715$