

Pitch Perfect Geometry

A soccer field is packed with geometry: right angles in every corner, parallel lines, circles and arcs. Use your geometry words to explore the made-up Riverside Rovers' home field. Every player and team on this sheet is made up.

Name _____

Date _____

GEOMETRY TOOLKIT



Right angle

a square corner: exactly 90°



Acute angle

smaller than a right angle



Obtuse angle

bigger than a right angle, less than 180°



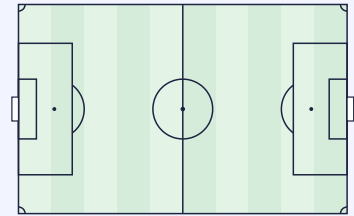
Parallel

lines that never meet, always the same distance apart



Perpendicular

lines that cross to make right angles



RECTANGLES, CIRCLES & ARCS

ROOKIE

- 1 The Riverside Rovers' home field is shaped like a **rectangle**. How many **right angles** does a rectangle have?

WORK SPACE



_____ right angles

ROOKIE

- 2 Winger Nia's pass and the goal line make the angle shown. Is it **acute**, **right** or **obtuse**?

WORK SPACE



STARTER

- 3 The goal line and the touchline meet at the corner flag in a square corner. Are these two lines **parallel** or **perpendicular**?

WORK SPACE



STARTER

- 4 At kickoff, the other team must stay **10 yards** from the ball, so the center circle reaches 10 yards from the center spot in every direction. How far is it **straight across** the circle, through the center spot?

WORK SPACE



_____ yards

PRO

- 5 A **quarter turn** is 90° . Goalkeeper Sofia makes **three** quarter turns in a row. How many degrees did she turn in all?

WORK SPACE



_____ degrees

PRO

- 6 At the corner flag, the goal line and the touchline make a **90°** angle. Captain Leo's corner kick makes a **35°** angle with the goal line. What angle does it make with the touchline?

WORK SPACE



_____ degrees

ALL-STAR

- 7 The penalty area is a rectangle **44 yards** wide and **18 yards** deep. How many **lines of symmetry** does it have? *Hint: picture folding it so both halves match.*

WORK SPACE



_____ lines

CHALLENGE ★

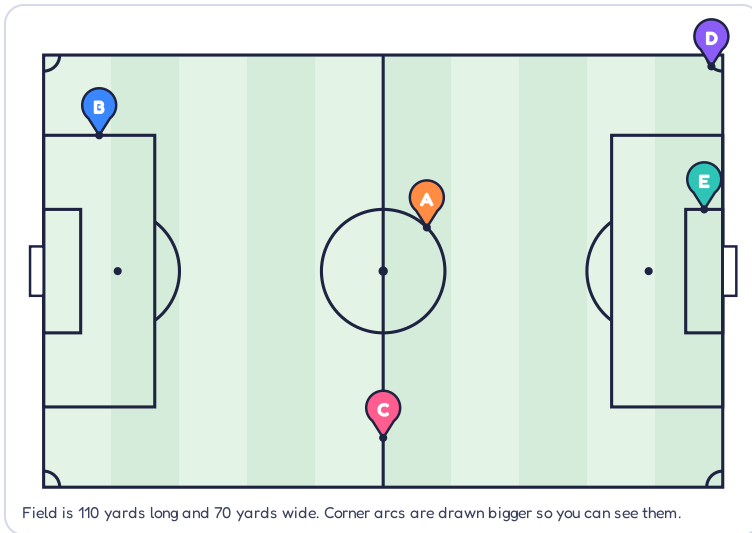
- 8 A soccer goal is **8 yards** wide and **8 feet** tall. Kim says the front of the goal is a **square** because both numbers are 8. Is she right? Explain. (*1 yard = 3 feet*)

WORK SPACE



A Map the Pitch

Each pin points to a part of the Rovers' field. Write the shape of each part, using the word bank. A word can be used more than once.



WORD BANK circle · rectangle · line segment · quarter circle

PIN	PART OF THE FIELD	SHAPE
A	Center circle	
B	Penalty area	
C	Halfway line	
D	Corner arc	
E	Goal area	
6	Name a line on the field that is parallel to the halfway line.	

B Angle Detective

Coach Rivera measured the angles of four passes. Read each protractor: start at 0 on the navy ray and count to the blue ray. Write the angle, then write **acute**, **right** or **obtuse**.

1 Pass P



Angle °
Type

2 Pass Q



Angle °
Type

3 Pass R



Angle °
Type

4 Pass S



Angle °
Type

- 5** Which **two** passes make angles that add up to **180°**, a straight line?
- 6** Write the four passes in order from the **smallest** angle to the **largest**.

C Turns & Angle Math

Add or subtract to find each angle. Draw a sketch if it helps.

- 1** Defender Max turns **90°** to his left, then **30°** more. How many degrees did he turn? Is that angle acute, right or obtuse?
- 2** The halfway line is a straight line, so it makes a **180°** angle at the center spot. Ana's kickoff pass splits it into two angles. One angle is **70°**. What is the other angle? degrees
- 3** A field sprinkler turns **30°** at a time. How many turns does it take to make one **full turn** of 360°? turns

THINK DEEPER



4. Coach marks a **square** passing grid, 10 yards on each side. How many **lines of symmetry** does a square have? Draw them on the grid.

lines

WORK SPACE

Answer Key (for teachers & parents)

Answers for **Pitch Perfect Geometry**. In Part B, accept readings within 5° of the answer and the matching angle type. In Part A, accept "line" for line segment. For problem 8, look for the idea that 8 yards is 24 feet.

Page 1 Problems

- Answer: 4 right angles**
Every corner of a rectangle is a square corner.
- Answer: acute**
It is smaller than a square corner, so it is less than 90°.
- Answer: perpendicular**
They meet and make a right angle.
- Answer: 20 yards**
10 yards to one side plus 10 yards to the other side.
- Answer: 270°**
 $90 + 90 + 90 = 270$.
- Answer: 55°**
The two parts make the 90° corner: $90 - 35 = 55$.
- Answer: 2 lines**
Fold it top to bottom or side to side. It is not a square, so the corner-to-corner folds do not match.
- Answer: No, it is a rectangle**
8 yards is $8 \times 3 = 24$ feet. The goal is 24 feet wide and 8 feet tall, so the sides are not equal.

A · Map the Pitch

- Answer: A: circle**
Every point on it is 10 yards from the center spot.
- Answer: B: rectangle**
4 straight sides and 4 right angles.
- Answer: C: line segment**
A straight path with two endpoints, one on each touchline.
- Answer: D: quarter circle**
One quarter of a circle fits in each 90° corner.
- Answer: E: rectangle**
A smaller rectangle inside the penalty area.
- Answer: Goal line**
Either goal line works. Both run the same way as the halfway line and never meet it.

Quick score

Page 1	_____ / 8
A · Map the Pitch	_____ / 6
B · Angle Detective	_____ / 6
C · Turns & Angle Math	_____ / 4
Total	_____ / 24

Skills practiced

- Acute, right & obtuse angles
- Parallel & perpendicular lines
- Lines of symmetry
- Naming 2-D shapes
- Reading a protractor
- Adding & subtracting angles
- Turns & degrees
- Yards to feet

Teaching tip: Have students make a "right-angle checker" by folding a scrap of paper twice. They can hold it in each angle: if the angle is smaller it is acute, and if it is bigger it is obtuse.

B · Angle Detective

- Answer: 140°, obtuse**
Count by 10s past the 120 label: 130, 140. More than 90°.
- Answer: 40°, acute**
Count 10 past the 30 label. Less than 90°.
- Answer: 120°, obtuse**
Right on the 120 label. More than 90°.
- Answer: 90°, right**
Right on the 90 label, a square corner.
- Answer: P and Q**
 $140^\circ + 40^\circ = 180^\circ$.
- Answer: Q, S, R, P**
 $40^\circ, 90^\circ, 120^\circ, 140^\circ$.

C · Turns & Angle Math

- Answer: 120°, obtuse**
 $90 + 30 = 120$, and 120 is more than 90.
- Answer: 110°**
 $180 - 70 = 110$.
- Answer: 12 turns**
 $360 \div 30 = 12$.
- Answer: 4 lines**
Top to bottom, side to side and both corner-to-corner folds.