

Chapter 6 Circles I Radius Diameter Circumference and Pi

Teacher Guide and Diagnostic Answer Key

Teacher Guide

Teacher Chapter-at-a-Glance

None required

Spend the most time on the radius-versus-diameter labeling habit. It is the chapter's central error and appears across nearly every problem type.

Ask: is this measurement a radius or a diameter? How do you know?

Mastery Decision Guide

What a missed Tripwire item actually means, and what to do about it before moving on.

Confirmation and Fresh Recheck

Confirm with: Ask the student to write $r = \underline{\quad}$ or $d = \underline{\quad}$ first, then say whether the question asks for distance around.

Fresh recheck: Give a circle with diameter 22 cm and ask for circumference; require r/d labeling before calculation.

Decision rule: Move forward only when the fresh response is secure and the reasoning survives the changed representation or context.

Missed Tripwire #1 → Using the radius as the diameter (Mistake 1). The circumference answer is exactly half of the correct value. Review before the next chapter.

Ready to Learn Check

Quick check before starting. A wrong answer below points to a specific gap worth closing first, not just a miss to shrug off.

1. Multiply 3.14 by 4.

Correct answer: 12.56

Likely wrong answer: 7.14 (adding instead of multiplying)

Misconception: Confusing multiplication with addition when a decimal is involved.

Next move: Review multiplying a decimal by a whole number before starting the chapter.

2. Divide 50 by 2.

Correct answer: 25

Likely wrong answer: 48 (subtracting 2 instead of dividing)

Misconception: Confusing division by 2 with subtracting 2.

Next move: Review dividing a number by 2 before starting the chapter.

3. For a circular rug, is the length of trim needed around its edge a measure of distance around, or space inside?

Correct answer: distance around

Likely wrong answer: space inside

Misconception: Not yet distinguishing a distance-around measurement from a space-inside measurement.

Next move: Review the difference between perimeter-style and area-style measurements before starting the chapter.

Practice

Assign the full set or select items for targeted review. Teacher solutions follow each question.

1. A circle has a radius of 9 cm. Find its diameter.

Solution: 1. 18 cm. Hint: A diameter contains two radii.

2. A circle has a diameter of 26 m. Find its radius.

Solution: 2. 13 m. Hint: A radius is half of a diameter.

3. Find the circumference of a circle with diameter 11 cm.

Solution: 3. 34.54 cm. Hint: Use $C = \pi d$.

4. Find the circumference of a circle with diameter 2.5 m.

Solution: 4. 7.85 m. Hint: Circumference is a little more than three times the diameter.

5. Find the circumference of a circle with radius 6 cm.

Solution: 5. 37.68 cm. Hint: Double the radius first, or use $C = 2\pi r$.

6. Find the circumference of a circle with radius 12.5 m.

Solution: 6. 78.5 m. Hint: The radius is the measurement from the centre to the edge.

7. A round mirror has a diameter of 80 cm. How much edging is needed to go around the mirror?

Solution: 7. 251.2 cm. Hint: Edging goes around the outside.

8. A wheel has a radius of 35 cm. How far does it travel in one full turn?

Solution: 8. 219.8 cm. Hint: One full turn equals one circumference.

9. A student says the circumference of a circle with diameter 15 cm is 47.1 cm^2 . What is correct, and what must be changed?

Solution: 9. The number 47.1 is correct, but the unit should be cm, not cm^2 . Hint: Circumference measures distance.

10. A circular track has circumference 94.2 m. Estimate its diameter.

Solution: 10. 30 m. Hint: Divide the circumference by 3.14.

Chapter Answer Key

Tripwire Check

1. The student is not correct. The 9 cm measurement is the radius, not the diameter. The diameter is 18 cm.
 $C = 3.14(18) = 56.52 \text{ cm}$.

Exit Ticket

1. 28 cm.

2. $C = 3.14(7.2) = 22.608 \text{ m}$.

3. Use $C = 2\pi r$. $C = 2(3.14)(0.9) = 5.652 \text{ m}$.

Worksheet 1: Guided Practice

1. centre	2. radius
3. 10 cm	4. diameter
5. 11 cm	6. circumference
7. 26 m	8. 3.14
9. 1.8 m	10. 18.84 cm
11. 53.38 m	12. 2.512 km
13. $d = 8$ cm; $C = 25.12$ cm	14. 47.1 m
15. 125.6 cm	

Worksheet 2: Independent Practice

1. 56.52 cm	2. 10.99 m
3. 32 cm	4. 376.8 cm
5. 69.08 cm	6. 22.5 m
7. 14.13 m	8. 3.768 km
9. 4.8 km	10. 94.2 cm
11. 87.92 m	12. 4.9 cm
13. 207.24 cm	14. 11.304 m
15. 50 m	

Worksheet 3: Mixed Practice & Application

Item 11 (Non-Routine)

Correct answer: 6.908 m. $C = 2 \times 3.14 \times 1.1 = 6.908$ m. The four legs and the table's height are not needed. Only the radius of the tabletop matters for the edge distance.

Likely wrong answer: An answer that tries to work the height or number of legs into the calculation.

Misconception: Assuming every number in a word problem must be used, instead of identifying which measurement is actually relevant.

Next move: Have the student underline only the measurement needed (the radius) before calculating, crossing out irrelevant details.

Item 12 (Non-Routine)

Correct answer: $d = 52$ cm, $r = 26$ cm. A large serving tray or a small tabletop could have this circumference. The diameter is twice the radius, and the circumference is π times the diameter.

Likely wrong answer: Stopping after finding only one of diameter or radius.

Misconception: Not carrying the calculation through both steps: circumference to diameter, then diameter to radius.

Next move: Have the student write out both conversions in order: $d = C \div \pi$, then $r = d \div 2$, before describing the object.

1. $d = 36$ cm; $C = 113.04$ cm	2. $r = 12.5$ m; $C = 78.5$ m
3. 5.024 m	4. $d = 24$ m; $r = 12$ m
5. 21.98 m	6. 26.69 cm
7. 40.82 m	8. 80 cm
9. 8.792 m	10. 84.78 m
11. (see diagnostic above)	12. (see diagnostic above)
13. $d = 34$ cm; $C = 106.76$ cm	14. 69.08 m
15. No; correct circumference is 62.8 cm	

Variation Lab — Expected Ideas

- $d=8$ and $r=4$ describe the same circle, so $\pi d = 2\pi r = 8\pi$.
- Diameter is 10 cm; circumference also needs π , so $C=10\pi \approx 31.4$ cm.
- An answer half the expected size suggests radius was substituted into $C=\pi d$ without doubling.

Transfer Check — Suggested Responses

Familiar: 43.96 cm. Altered: 43.96 cm. Non-routine: $d \approx 94.2 \div 3.14 = 30$ cm. Repair: $d=18$ cm or use $2\pi r$; $C \approx 56.52$ cm.