

Chapter 7 Circles II Area and Circular Composite Shapes

Teacher Guide and Diagnostic Answer Key

Teacher Guide

Teacher Chapter-at-a-Glance

None required

Spend the most time on the diameter-versus-radius squaring habit. It is the chapter's central error and produces an answer four times too large, not just half, which makes it easy to miss without checking.

Ask: is this measurement a radius or a diameter? What happens to the answer if you square the wrong one?

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, "Around or inside?" and then require the student to convert diameter to radius before writing $A = \pi r^2$.

Fresh recheck: Give a circle with diameter 14 cm and ask for area; require $r=7$ before squaring.

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

Missed Tripwire #1 → Using diameter as radius in the area formula (Mistake 1). The area answer is exactly four times too large. 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. Square the number 6.

Correct answer: 36

Likely wrong answer: 12 (doubling instead of squaring)

Misconception: Confusing squaring a number with doubling it.

Next move: Review what squaring a number means before starting the chapter.

2. A square has side length 7 cm. Find its area.

Correct answer: 49 cm^2

Likely wrong answer: 28 cm^2 (multiplying by 4 instead of squaring the side)

Misconception: Confusing a square's area with its perimeter procedure.

Next move: Review finding the area of a square before starting the chapter.

3. A shape has a total area of 50 cm^2 . A 15 cm^2 section is removed. Find the remaining area.

Correct answer: 35 cm^2

Likely wrong answer: 65 cm^2 (adding instead of subtracting)

Misconception: Not yet recognizing that a removed section means subtracting it.

Next move: Review subtracting one area from another before starting the chapter.

Practice

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

1. Find the area of a circle with radius 3 cm.

Solution: 1. 28.26 cm^2 .

2. Find the area of a circle with radius 10 m.

Solution: 2. 314 m^2 .

3. Find the area of a circle with diameter 38 cm.

Solution: 3. 1133.54 cm^2 .

4. Find the area of a circle with diameter 30 m.

Solution: 4. 706.5 m^2 .

5. Find the area of a semicircle with radius 6 cm.

Solution: 5. 56.52 cm^2 .

6. Find the area of a quarter circle with radius 8 cm.

Solution: 6. 50.24 cm^2 .

7. A circular garden has radius 6.5 m. Find the area of the garden.

Solution: 7. 132.67 m^2 (rounded from 132.665).

8. A square tile is 50 cm by 50 cm. A circular design with radius 21 cm is painted on it. Find the painted circular area.

Solution: 8. 1384.74 cm^2 .

9. A square sheet is 18 cm by 18 cm. A circular hole with radius 5 cm is cut out. Find the area left in the sheet.

Solution: 9. 245.5 cm^2 .

10. A circle has diameter 24 cm. A student calculates $A = 3.14 \times 24^2$. Explain the mistake and find the correct area.

Solution: 10. Radius, not diameter, should be squared; radius is 12 cm; correct area is 452.16 cm^2 .

Chapter Answer Key

Tripwire Check

1. Not correct. Correct area is 200.96 cm^2 .

Exit Ticket

1. 254.34 cm^2 .

2. 314 m^2 .

3. $225 - 28.26 = 196.74 \text{ m}^2$.

Worksheet 1: Guided Practice

1. area	2. 5 cm
3. circumference	4. 8 m
5. area	6. 12.56 cm^2
7. 12 cm	8. circumference
9. 3.5 m	10. 1519.76 m^2
11. $r = 23$; 1661.06 cm^2	12. $132.665 \rightarrow 66.33 \text{ cm}^2$ (rounded from 66.3325)
13. $r = 9.3$; 271.58 m^2 (rounded from 271.5786)	14. $50.24 \rightarrow 12.56 \text{ m}^2$
15. $100 - 28.26 = 71.74 \text{ cm}^2$	

Worksheet 2: Independent Practice

1. 153.86 cm^2	2. 157 cm^2
3. 277.45 m^2 (rounded from 277.4504)	4. 113.04 cm^2
5. 1962.5 cm^2	6. 2122.64 m^2
7. 572.27 cm^2 (rounded from 572.265)	8. 127.17 m^2
9. 530.66 m^2	10. 176.63 m^2 (rounded from 176.625)
11. 1256 cm^2	12. 574.76 m^2
13. 1.77 m^2 (rounded from 1.76625)	14. 78.5 cm^2
15. Diameter squared instead of radius; correct area 615.44 cm^2 .	

Worksheet 3: Mixed Practice & Application

Item 11 (Non-Routine)

Correct answer: 13.85 m^2 (rounded from 13.8474). $A = 3.14 \times 2.1^2$. The net height and the number of attachment points are not needed; only the radius determines the trampoline's surface area.

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

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

Next move: Have the student underline only the diameter (or radius) before calculating, crossing out irrelevant details like the net height.

Item 15 (Non-Routine)

Correct answer: $r \approx 6.2$ cm, $d \approx 12.4$ cm (checking: $3.14 \times 6.2^2 = 120.7016$, close to the given 120.70). A small serving plate or a coaster could have this area. The diameter is twice the radius, and the area uses the radius squared, not the diameter.

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

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

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

1. 379.94 cm ²	2. 907.46 m ²
3. 127.17 cm ²	4. 19.625 m ²
5. 56.94 m ² (rounded from 56.935)	6. 2826 cm ²
7. 283.39 m ² (rounded from 283.385)	8. 939.77 cm ² (rounded from 939.7706)
9. 40.69 m ² (rounded from 40.6944)	10. 115.74 m ²
11. (see diagnostic above)	12. 0.77 m ² (rounded from 0.7693)
13. 393.88 cm ² (rounded from 393.8816)	14. Not correct; correct area is 254.34 cm ²
15. (see diagnostic above)	

Variation Lab — Expected Ideas

1. $r=4$ and $d=8$ describe the same circle, so both use $r=4$ in $A=\pi r^2$.
2. $12^2=144$ but correct radius is 6, so $r^2=36$; using diameter makes the area four times too large.
3. Same circle: circumference $C=\pi d$ or $2\pi r$; area $A=\pi r^2$.

Transfer Check — Suggested Responses

Familiar: 78.5 cm². Altered: $r=9$, so $A \approx 254.34$ m². Non-routine: $196 - 28.26 = 167.74$ cm². Repair: $r=10$, so $A \approx 314$ cm².