Circumference of a Circle

Spot mistakes, reason, and work backward

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Circumference is distance around a circle: $C = 2\pi r = \pi d$, in linear units. At $r = 2.5$ cm, $C = 5\pi$ cm. A semicircle perimeter adds its diameter to half the full rim length.

Worked example

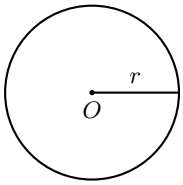
Find the exact circumference for a diameter of 7 cm.

1. Given $d = 7$ cm, the radius is $7/2 = 3.5$ cm.
2. Using the diameter, $C = \pi d = 7\pi$ cm.
3. Using the radius gives the same result: $2\pi(3.5) = 7\pi$ cm.
Answer: 7π cm.

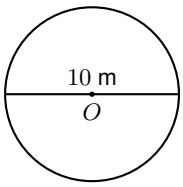
Practice Problems

Show your thinking.

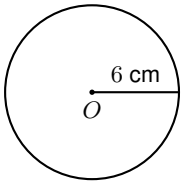
1. A circle has circumference 8π cm. Recover its diameter and radius.



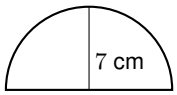
2. A student uses $C = 2\pi(10)$ when 10 m is the diameter. Correct the calculation using 3.14 for π.



3. A student uses πr^2 for the circumference of a circle of radius 6 cm. Find the correct measure and explain the error.

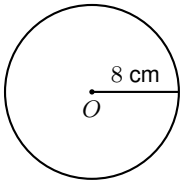


4. A student says a semicircle of radius 7 cm has perimeter 7π cm. Find the missing edge length and correct perimeter.

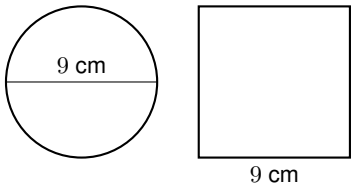


d (straight edge)

5. For three turns without slipping, a student adds 3 cm to the circumference of a radius-8 cm wheel. Correct the exact distance.



6. A square and a circle each have width 9 cm. A student uses $4(9)$ for both boundaries. Explain and correct using 3.14 for π.



7. The curved edge of a semicircular arch measures 11π cm. Find the full circumference and the diameter.

8. A wheel of radius 4 cm rolls 20π cm without slipping. Find its number of turns, including any partial turn.

Answer Key

1. Diameter 8 cm; radius 4 cm.
2. 10π m; about 31.4 m.
3. 12π cm; πr^2 is area.
4. Missing edge 14 cm; perimeter $(7\pi + 14)$ cm.
5. 48π cm.
6. Square is longer: 36 cm versus 28.26 cm.
7. Circumference 22π cm; diameter 22 cm.
8. $5/2$ turns.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Use $C = \pi d$ and divide by π: $d = 8\pi/\pi = 8$ cm.
2. Halve the diameter: $r = 8/2 = 4$ cm.
3. Check $2\pi(4) = 8\pi$ cm.

Problem 2

1. The full width is $d = 10$ m, so the radius is $10/2 = 5$ m.
2. Use $C = \pi d = 10\pi$ m; the diameter is not doubled.
3. Using 3.14 gives $3.14(10) = 31.4$ m.

Problem 3

1. $\pi(6)^2 = 36\pi$ cm^2 measures the disk area.
2. The center width is $2(6) = 12$ cm.
3. The linear measure is $C = 2\pi(6) = 12\pi$ cm.

Problem 4

1. The curved edge is half a full circle: $14\pi/2 = 7\pi$ cm.
2. The straight edge is the diameter, $2(7) = 14$ cm.
3. Add both: $P = 7\pi + 14$ cm.

Problem 5

1. Each turn covers $2\pi(8) = 16\pi$ cm.
2. Three equal turns give $3(16\pi) = 48\pi$ cm.
3. Check: $48\pi/(16\pi) = 3$ turns.

Problem 6

1. The square has four equal sides: $P = 4(9) = 36$ cm.
2. The circle has diameter 9 cm: $C \approx 3.14(9) = 28.26$ cm.
3. Compare: $36 > 28.26$, so the square has the longer boundary.

Problem 7

1. The curved edge is half the full rim, so $C = 2(11\pi) = 22\pi$ cm.
2. Use $C = \pi d$: $d = 22\pi/\pi = 22$ cm.
3. Half the circumference of a 22 cm diameter circle is $22\pi/2 = 11\pi$ cm.

Problem 8

1. Each turn covers $2\pi(4) = 8\pi$ cm.
2. Divide distance by distance per turn: $20\pi/(8\pi) = 5/2$.
3. Check: $(5/2)(8\pi) = 20\pi$ cm.

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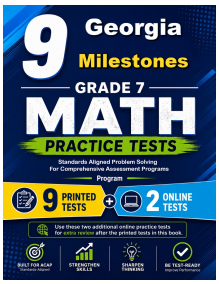

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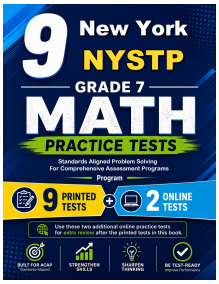

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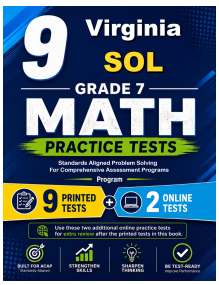

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