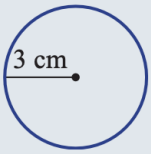
WALT Calculate circumference of a circle
Success Criteria

- can define circumference.
- I can identify the circumference of a circle.
- I can calculate the circumference of a circle, given the radius or diameter.
- I can solve problems involving the circumference of a circle.

Example 4 Finding the circumference of a circle

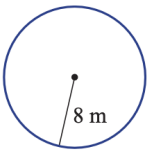
Find the circumference of this circle correct to two decimal places.



Solution	Explanation
$C = 2\pi r$ $= 2 \times \pi \times 3$ $= 6\pi$ $= 18.85$ cm	Use the formula $C = 2\pi r$ or $C = \pi d$ and substitute $r = 3$ (or $d = 6$). 6π would be the exact answer and 18.85 is the rounded answer.

5 Find the circumference of these circles correct to two decimal places. Use a calculator for the value of π.

a



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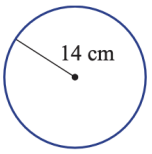

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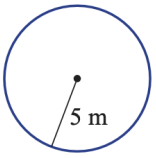

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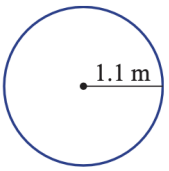

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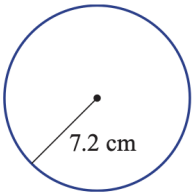

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Write the rule $C = 2\pi r$, then substitute the radius length.

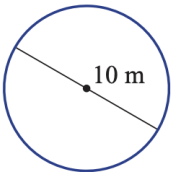
Example 5 Finding circumference using the diameter

Find the circumference of this circle, correct to two decimal places.

Solution	Explanation
$C = \pi d$ $= \pi \times 12$ $= 37.70$ m	Write the formula. $C = \pi d$ is preferred since d is given. Substitute $d = 12$ and multiply by π. Use a calculator and round. Note: 37.6991 rounds to 37.70 for two decimal places.

6 Find the circumference of these circles correct to two decimal places.

a



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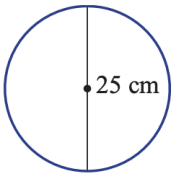

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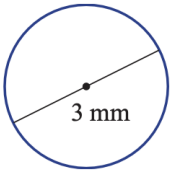

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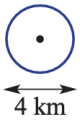

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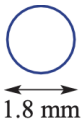

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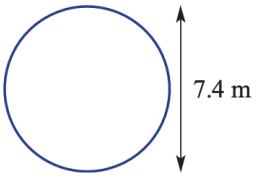
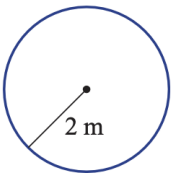


Write the rule $C = \pi d$ and substitute the diameter length.

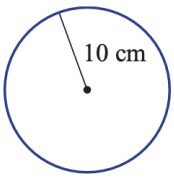
7 Find the circumference of these circles without a calculator using the given approximation of π.

a



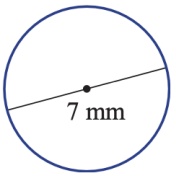
$\pi = 3.14$

b



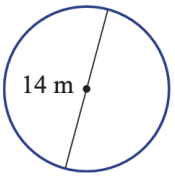
$\pi = 3.14$

c



$\pi = \frac{22}{7}$

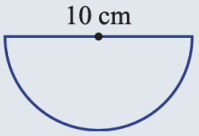
d



$\pi = \frac{22}{7}$

Example 6 Working with a semicircle

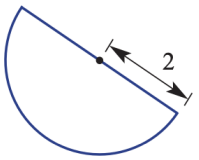
Find the perimeter of this semicircle correct to two decimal places.



Solution	Explanation
$P = \frac{1}{2} \times \pi d + 10$ $= \frac{1}{2} \times \pi \times 10 + 10$ $= 25.71$ cm	The perimeter consists of half the circumference of a circle (with diameter 10 cm) plus the 10 cm diameter across the top.

8 Find the perimeter of these sectors correct to two decimal places.

a



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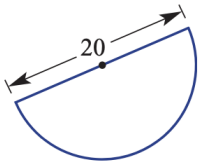

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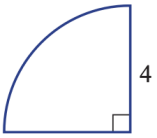

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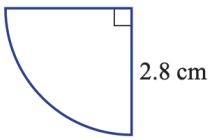

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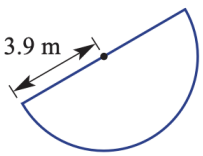

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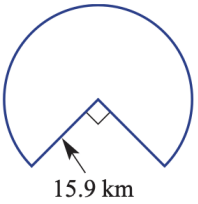


Decide what fraction of the circumference you want and don't forget to add the straight sides.

Extension

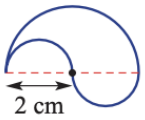
Problem-solving and Reasoning

9 Find the distance around the outside of a circular pool of radius 4.5 m, correct to two decimal places.

10 Find the length of string required to surround the circular trunk of a tree that has a diameter of 1.3 m, correct to one decimal place.

11 Give the perimeter of these shapes, correct to two decimal places.

a



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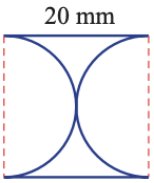


c

Two semicircles of the same size make a full circle.

The rolling wheel

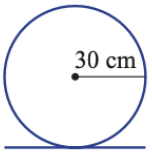
12 A wheel of radius 30 cm is rolled in a straight line.

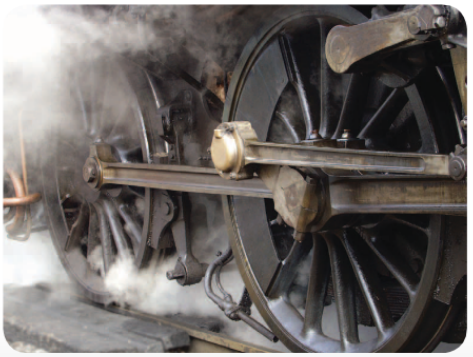
a Find the circumference of the wheel correct to two decimal places.

b How far, correct to two decimal places, has the wheel rolled after completing:

i 2 rotations? **ii** 10.5 rotations?

c Can you find how many rotations would be required to cover at least 1 km in length? Round to the nearest whole number.





Check Your Answers

5 **a** 50.27 m **b** 87.96 cm **c** 31.42 m
d 6.91 m **e** 45.24 cm **f** 101.79 mm

6 **a** 31.42 m **b** 78.54 cm **c** 9.42 mm
d 12.57 km **e** 5.65 mm **f** 23.25 m

7 **a** 12.56 m **b** 62.8 cm **c** 22 mm **d** 44 m

8 **a** 10.28 **b** 51.42 **c** 14.28
d 10.00 cm **e** 20.05 m **f** 106.73 km

9 28.27 m **10** 4.1 m

11 **a** 12.57 cm **b** 102.83 mm **c** 41.06 m

12 **a** 188.50 cm **b** **i** 376.99 cm **ii** 1979.20 cm
c 531