

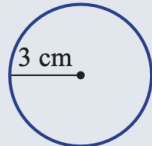
WALT Calculate circumference of a circle

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

$$\begin{aligned}C &= 2\pi r \\ &= 2 \times \pi \times 3 \\ &= 6\pi \\ &= 18.85 \text{ cm}\end{aligned}$$

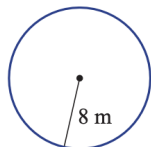
Explanation

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.

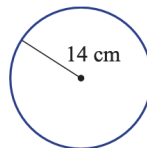


5 Find the circumference of these circles correct to two decimal places. Use a calculator for the value of π .

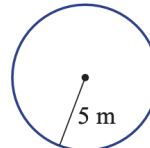
a



b



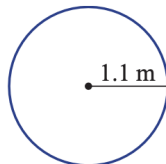
c



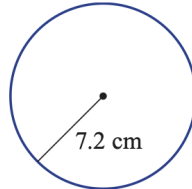
Write the rule $C = 2\pi r$, then substitute the radius length.



d



e



f



Example 5 Finding circumference using the diameter

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



Solution

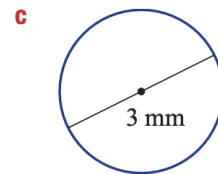
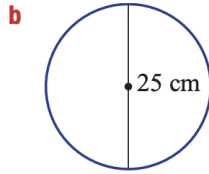
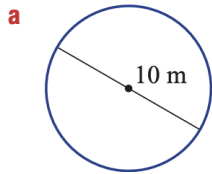
$$\begin{aligned}C &= \pi d \\ &= \pi \times 12 \\ &= 37.70 \text{ m}\end{aligned}$$

Explanation

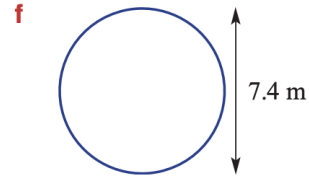
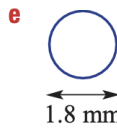
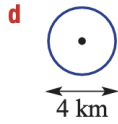
Write the formula. $C = \pi d$ is preferred since d is given. Substitute $d = 12$ and multiply by π . Use a calculator and round. Note: 37.6991 rounds to 37.70 for two decimal places.



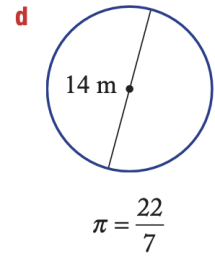
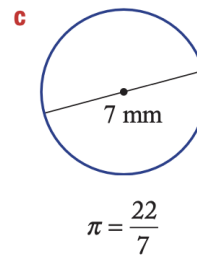
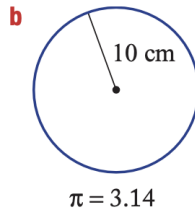
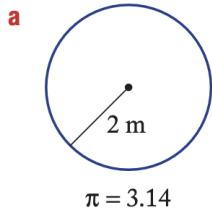
6 Find the circumference of these circles correct to two decimal places.



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

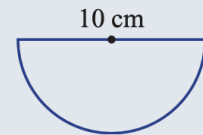


7 Find the circumference of these circles without a calculator using the given approximation of π .



Example 6 Working with a semicircle

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



Solution

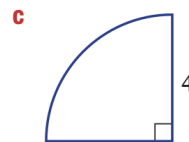
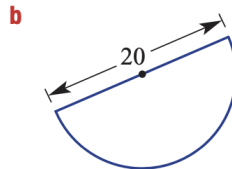
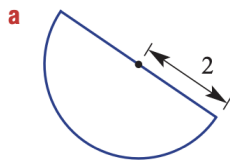
$$\begin{aligned} P &= \frac{1}{2} \times \pi d + 10 \\ &= \frac{1}{2} \times \pi \times 10 + 10 \\ &= 25.71 \text{ cm} \end{aligned}$$

Explanation

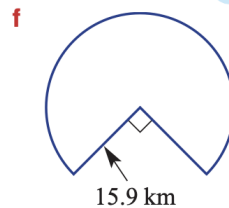
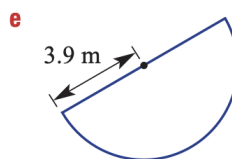
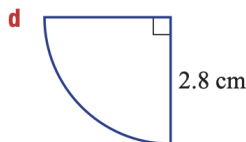
The perimeter consists of half the circumference of a circle (with diameter 10 cm) plus the 10 cm diameter across the top.



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



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



Extension

Problem-solving and Reasoning

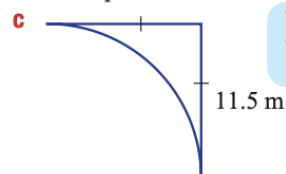
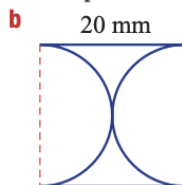
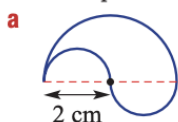


- 9 Find the distance around the outside of a circular pool of radius 4.5 m, correct to two decimal places.



- 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.



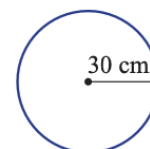
Two semicircles of the same size make a full circle.



The rolling wheel



- 12 A wheel of radius 30 cm is rolled in a straight line.
- Find the circumference of the wheel correct to two decimal places.
 - How far, correct to two decimal places, has the wheel rolled after completing:
 - 2 rotations?
 - 10.5 rotations?
 - 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

Exercise 62 cont.

- 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