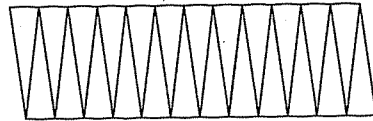
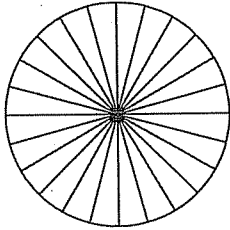


Quick Review

- When a circle is divided into many congruent sectors, the sectors can be arranged to approximate a parallelogram.



The more congruent sectors we use to divide the circle, the closer the area of the parallelogram is to the area of the circle.

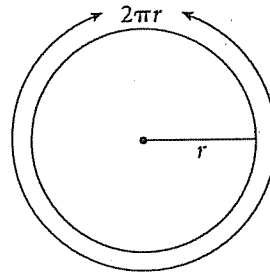
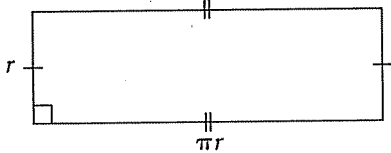
For even greater numbers of sectors, the parallelogram approaches a rectangle.
So, area of circle = area of rectangle

The sum of the 2 longer sides of the rectangle is equal to the circumference, C .

Length of rectangle: $l = \frac{C}{2} = \frac{2\pi r}{2} = \pi r$

Each of the shorter sides is equal to the radius r .

Width of rectangle: $w = r$



So, the area of a circle with radius r is:

$$\begin{aligned} A &= l \times w \\ &= \pi r \times r \\ &= \pi r^2 \end{aligned}$$

- You can use the formula $A = \pi r^2$ to find the area of any circle given the radius r .

The radius of a circle is 12 cm.

To estimate the area, use: $A = 3r^2$

Substitute: $r = 12$

$$\begin{aligned} A &= 3(12)^2 \\ &= 432 \end{aligned}$$

The area is about 432 cm².

To calculate the area, use: $A = \pi r^2$

Substitute: $r = 12$

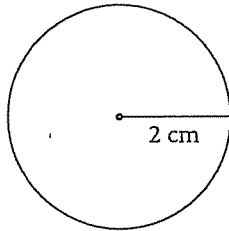
$$\begin{aligned} A &= \pi \times 12^2 \quad \text{Use a calculator.} \\ &= 452.389 \end{aligned}$$

The area is 452.39 cm² to 2 decimal places.

Practice

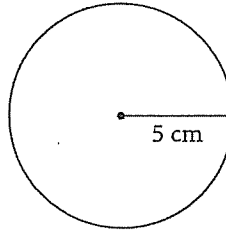
1. Estimate the area of each circle.

a)



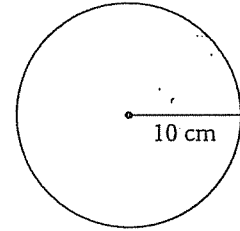
Area: _____

b)



Area: _____

c)



Area: _____

2. Calculate the area of each circle in question 1.

Give the answers to two decimal places.

a) $r =$ _____

b) $r =$ _____

c) $r =$ _____

$$A = \pi \times (\text{_____})^2$$

8 _____

Area: _____

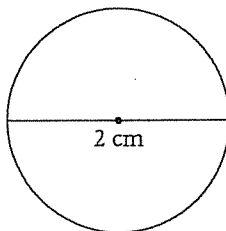
Area: _____

Area: _____

3. Calculate the area of each circle.

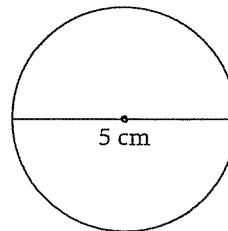
Give the answers to two decimal places.

a)



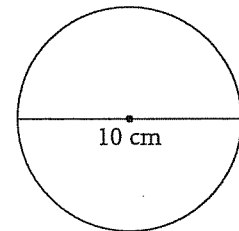
$r =$ _____

b)



$r =$ _____

c)



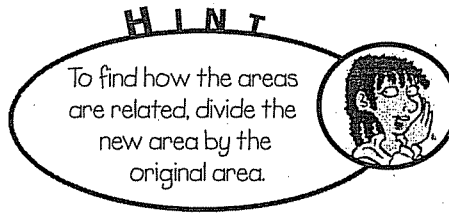
$r =$ _____

Area: _____

Area: _____

Area: _____

4. Use the results of questions 2 and 3.
What happens to the area of a circle when its radius is doubled?

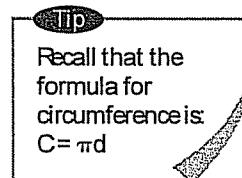


What happens to the area of a circle when its radius is halved?

5. A machine is cutting circular coasters out of foam.
- a) Each coaster has a diameter of 12 cm. What is its radius? _____
 - b) What is the area of each coaster? _____
 - c) Each piece of foam is a rectangle measuring 144 cm by 984 cm.
What is the area of the foam? _____
 - d) The coasters are cut with minimum waste.
How many coasters can be cut from each piece of foam?

- e) What area of foam is wasted?

6. The circumference of a circle is 92 cm. Calculate the area of the circle.
Give the answer to one decimal place. Show your work.



The area of the circle is _____.