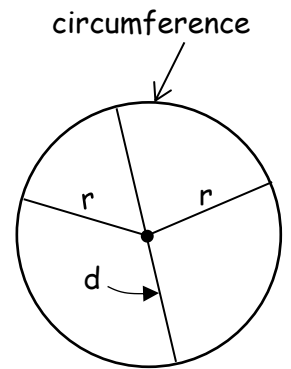


RUDIMENTS OF CIRCLE

The **circumference** is the distance around a circle, i.e. the curved line.

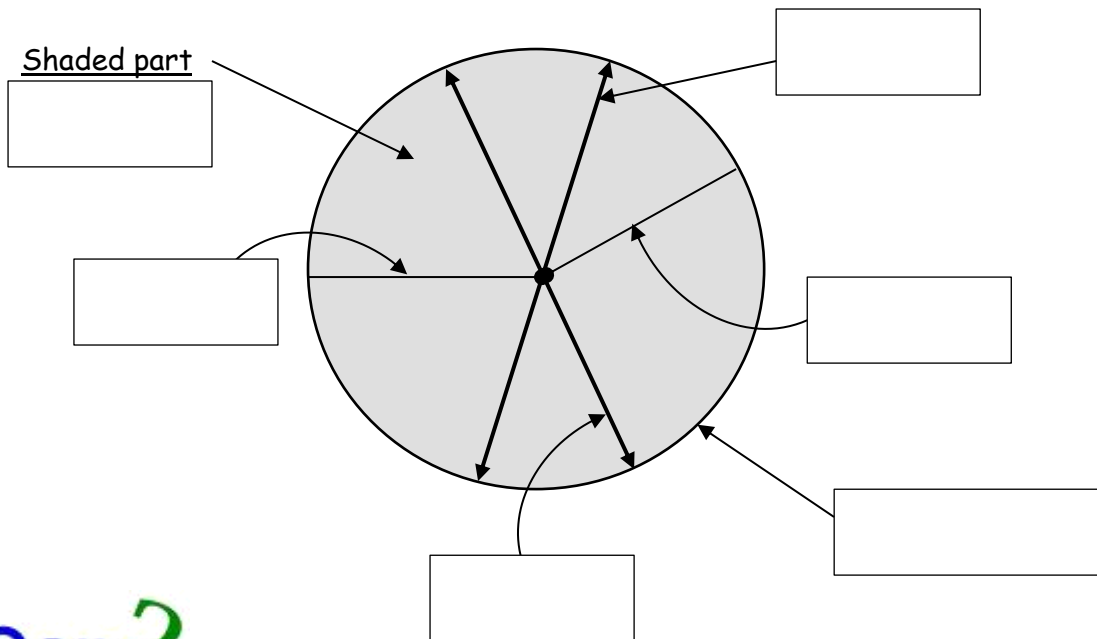
A **radius (r)** is a straight line from the centre to a point on the circumference of the circle. The plural form of radius is radii.



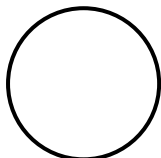
A **diameter (d)** is any straight line that joins two points on the circumference and **passes through** the centre of the circle. A diameter is twice of a radius.

An **area** of a circle is the boundary surface of a circle.

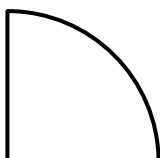
Fill in the boxes with the correct terms.



(1) Is **Circumference** of a circle the same as the **Perimeter** of a circle? Yes / No



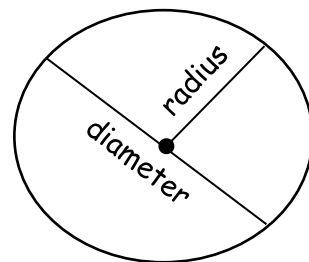
(2) Is **Circumference** of a quadrant the same as the **Perimeter** of a quadrant? Yes / No



Formulas in finding Circumference and Area of a Circle

Circumference of a circle →

$$\pi \times \text{diameter } (\pi d) \text{ or } \pi \times 2 \times \text{radius } (2\pi r)$$



Area of a circle →

$$\pi \times \text{radius} \times \text{radius } (\pi r^2)$$



Pi (π)

What is Pi (π)?

Pi, denoted by the Greek letter (π) - pronounced as 'pie', is an irrational number (never ending decimal values, i.e. **3.1415926 ...**) which is computed using the circumference of **any** circle divided by its diameter.

So, what does the value of pi (π) tells you?

It tells you that the circumference of a circle will always be **3.14 ... times of its diameter!!**



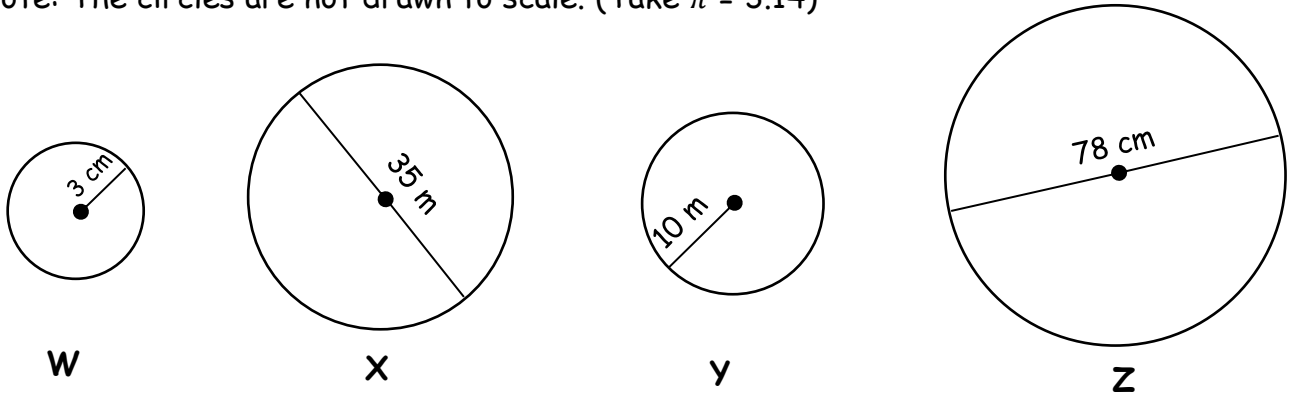
Types of Pi (π)

Pi (π) can be expressed in 4 different forms. They are:

- Leave in terms of π , e.g. $3 \times \pi = 3\pi$ (it is similar to algebraic expression)
- as a decimal, i.e. 3.14
- as a fraction, i.e. $\frac{22}{7}$ (usually used when the radius or diameter is the multiples of 7)
- Calculator pi (where the question will require you to round off the final answer to whole number, 1 decimal place or 2 decimal places). **Note:** In your intermediate working steps, leave your answer up to 4 decimal places before rounding off e.g. $3 \times \pi = 3\pi = 9.4247 \dots$

1. Complete the table below based on the given circles, W, X, Y and Z.

Note: The circles are not drawn to scale. (Take $\pi = 3.14$)



Circle	Radius	Diameter	Circumference	Area
W	3 cm			
X		35 m		
Y	10 m			
Z		78 cm		

Shapes found in a Circle.

2. Fill in the blanks.

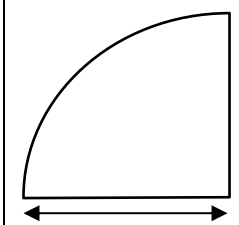
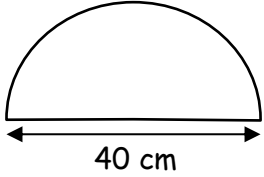
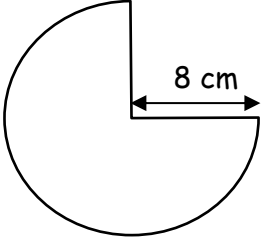
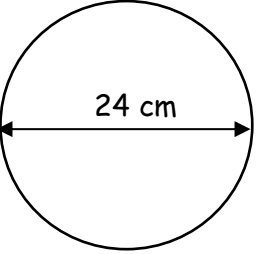
Figure	Name of shapes	Circumference (Take π as $\frac{22}{7}$)	Perimeter (Take π as $\frac{22}{7}$)	Area (Take π as $\frac{22}{7}$)
a) 				

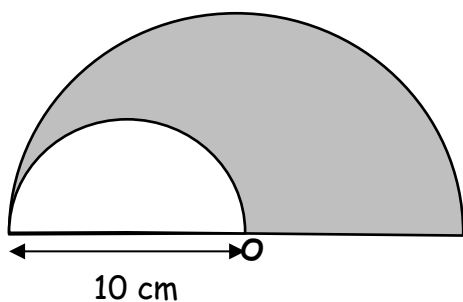
Figure	Name of shapes	Circumference (Take π as 3.14)	Perimeter (Take π as 3.14)	Area (Take π as 3.14)
b) 				
Figure	Name of shapes	Circumference (Leave in terms of π)	Perimeter (Leave in terms of π)	Area (Leave in terms of π)
c) 				
Figure	Name of shapes	Circumference (Use calculator π & round off to 1 dec. pl.)	Perimeter (Use calculator π & round off to 2 dec. pl.)	Area (Use calculator π & round off to whole number)
d) 				

What is the difference between a circumference of a quadrant and perimeter of a quadrant?

Answer: _____

3. The following figures are made up of circles, semicircles and quarter circles where **O** represents the **centre** of the respective circles. Find the perimeter and area of the shaded part in terms of π .

a)

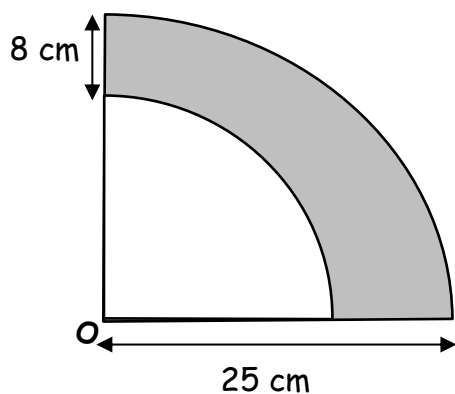


Answer:

Perimeter: _____

Area: _____

b)

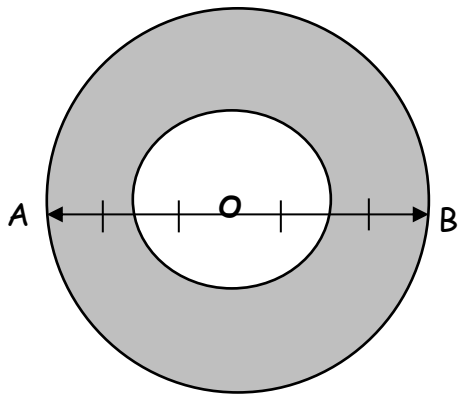


Answer:

Perimeter: _____

Area: _____

c)

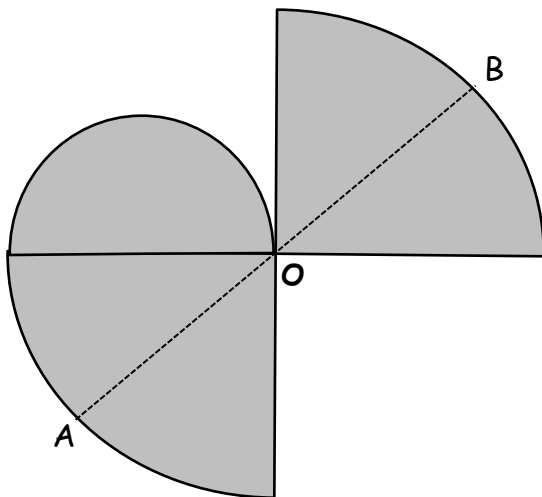


Line AB = 24 cm

Answer:
Perimeter: _____

Area: _____

d)

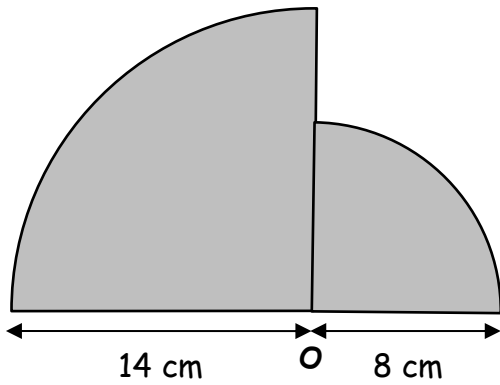


Line AB = 18 cm

Answer:
Perimeter: _____

Area: _____

e)



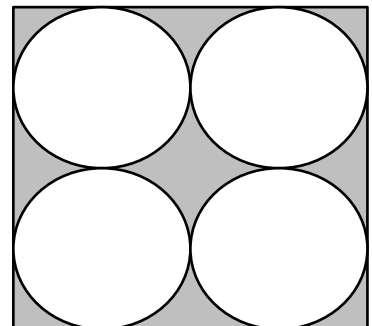
Answer:

Perimeter: _____

Area: _____

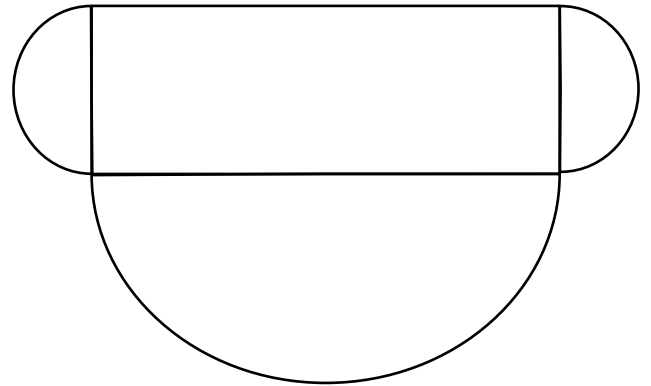
Circles in composite figures.

4. The figure shows 4 identical circles within a square. The area of the square is 484 cm^2 . Find the shaded area of the figure. Leave your answer in terms of π .



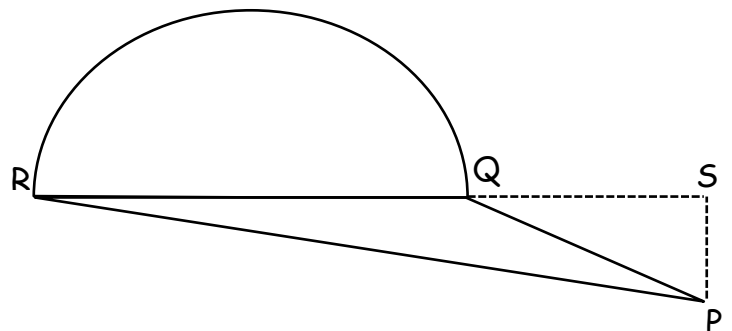
Answer: _____

5. The figure below is made up of a rectangle, 2 identical small semicircles and 1 big semicircle. The length of the rectangle is thrice as long its breadth. Given that the radius of the small semicircle is 18 cm, find the area of the figure. Use the calculator value of π and give your answer correct to 2 decimal places.



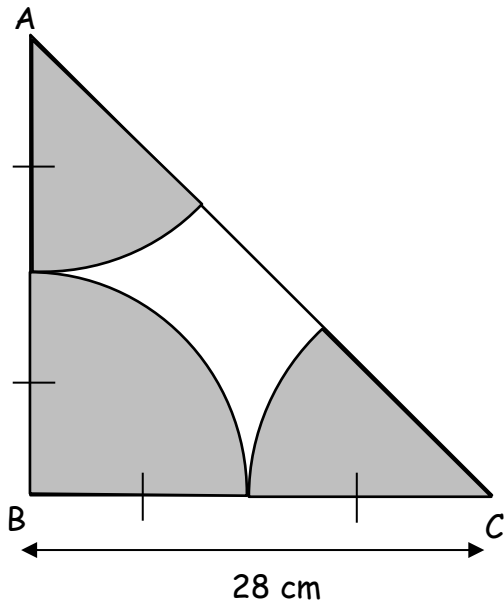
Answer: _____

6. The figure is made up of Triangle PQR and a semicircle. RQ: SP = 3 : 1. Given that SP = 7 cm, find the area of the figure. Use the calculator value of π and give your answer correct to 1 decimal place.



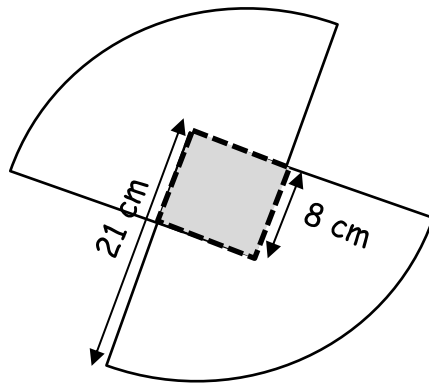
Answer: _____

7. Triangle ABC is a right-angled isosceles triangle. The quadrant and the 2 sectors of a circle have the same radius. Find the area of the shaded part. (Take $\pi = \frac{22}{7}$)



Answer: _____

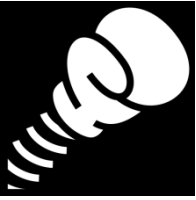
8. The figure is made up of 2 quarter circles, each of radius 21 cm. The shaded part is a square of side 8 cm.



- (a) Find the area of the whole figure.
 (b) Find the perimeter of the whole figure.
 (Take $\pi = \frac{22}{7}$)

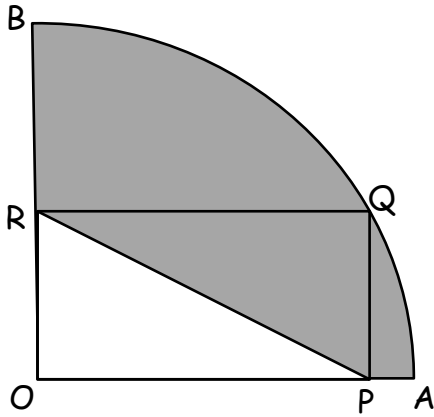
Answer: (a) _____

(b) _____



CHALLENGE ROUND!!

9. *In the diagram, AOB is a quadrant and $PQRO$ is a rectangle of perimeter 36 cm. $RP = 14$ cm. Find the perimeter of the shaded region. (Take $\pi = \frac{22}{7}$)



Answer: _____