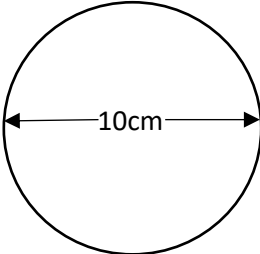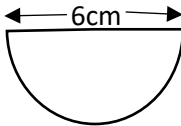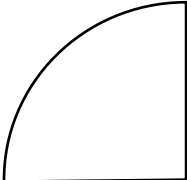# Circles

The aim of today's revision session is to remind you how to find the area and circumference of a circle. We will also look at finding the area and circumference of more complicated shapes which may include rectangles, triangles, half and quarter circles.
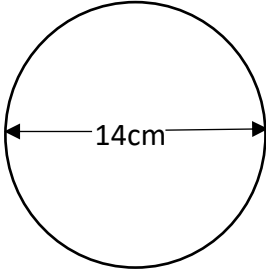
Area of a circle

Have a look at these examples:-

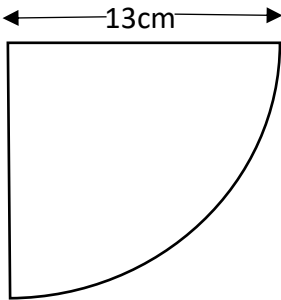|			
a) Calculate the area of a circle which has a radius of 9 cm. **Area = π × r²** **= 3.14 × 9²** **= 254.34cm²**	**b)** Calculate the area of the circle shown below. 10cm **Diameter = 10cm so Radius = 5cm** **Area = π × r²** **= 3.14 × 5²** **= 78.5cm²**	**c)** Calculate the area of the half circle shown below. 6cm **Diameter = 6cm so Radius = 3cm** **Area = ½ π × r²** **= 0.5 × 3.14 × 3²** **= 14.13cm²**	**d)** Calculate the area of the quarter circle show below. 7cm **Area = ¼ π × r²** **= 0.25 × 3.14 × 7²** **= 38.465cm²**

Now try these examples:-

1) Calculate the area of a circle radius 8cm.

2) Calculate the area of a circle radius 4.5m.

3) Calculate the area of a circle diameter 24mm.

4) Calculate the area of a half circle diameter 90cm

5) Calculate the area of a quarter circle radius 1.5m.
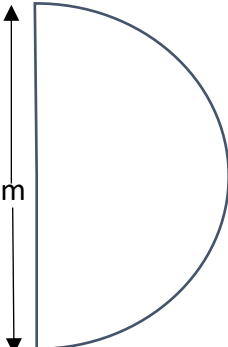
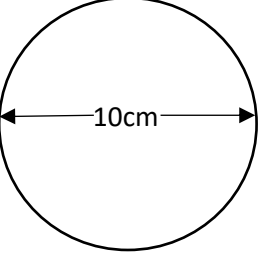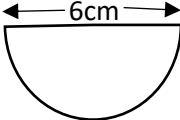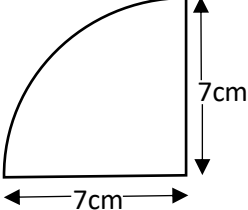6) Calculate the area of these shapes:-

a)

14cm

b)

13cm

c)

15cm

Finding the circumference of a circle

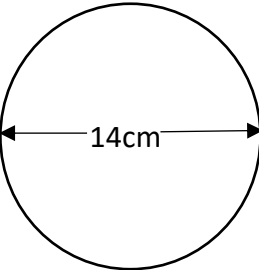Remember that the circumference is the distance all the way round the edge of the circle.

When we are dealing with half or quarter circles we need to be clear whether we are calculating the length of the curved part of the shape only or perimeter (total distance round the shape – include straight sides).

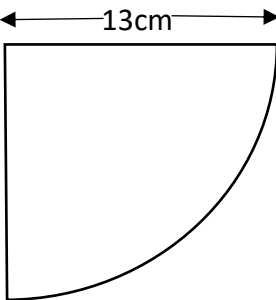| **a)** Calculate the area of the circle shown below.	b) Calculate the circumference of a circle which has a radius of 9cm.	c) Calculate the length of the curved part of the half circle shown below.	**d)** Calculate the perimeter of the quarter circle show below.
 Circumference = π × d 　　　**= 3.14 × 10** 　　　**= 31.4cm**	**Radius = 9cm so the diameter = 18 cm** **Circumference = π × d** 　　　**= 3.14 × 18** 　　　**= 56.52cm**	 **L. of curve = ½ π × d** 　　　**= 0.5 × 3.14 × 18** 　　　**= 28.26cm**	 **rad.= 7cm so diam.= 14cm** **L. of curve = ¼ π × d** 　　　**= 0.25 × 3.14 × 14** 　　　**= 10.99cm** **Perimeter = 7 + 7 + 10.99** 　　　**= 24.99cm**

Now try these examples:-

1) Calculate the circumference of a circle diameter 28cm.

2) Calculate the circumference of a circle radius 4.5m.

3) Calculate the circumference of a circle diameter 24mm.

4) Calculate the perimeter of a half circle diameter 90cm

5) Calculate the length of the curved side of a quarter circle radius 1.5m.

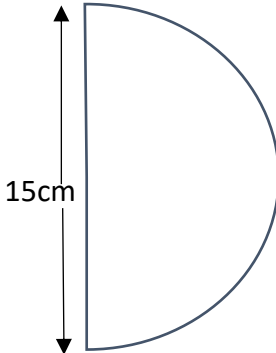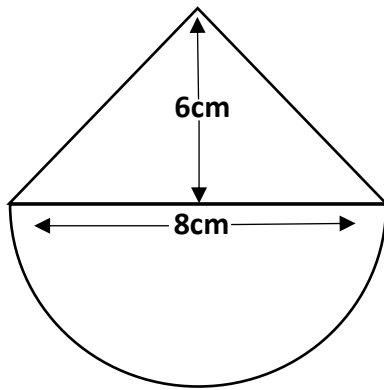**6)** Calculate the perimeter* of these shapes:-

a)

b)

c)

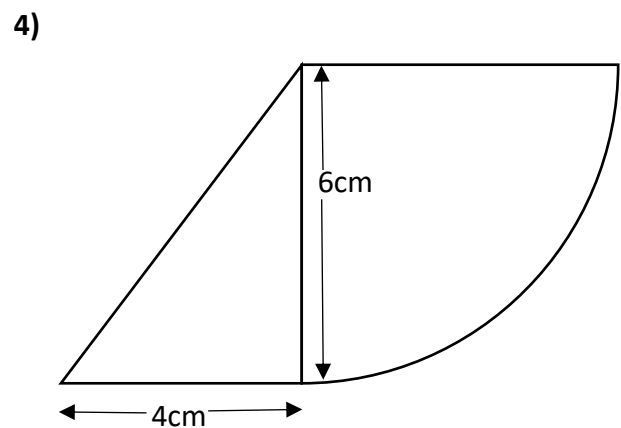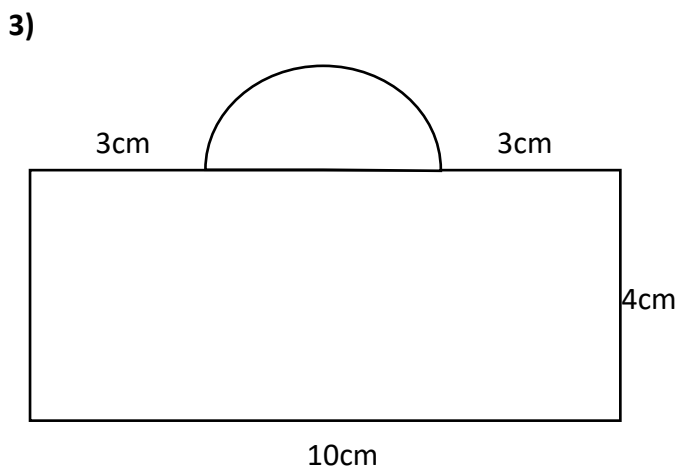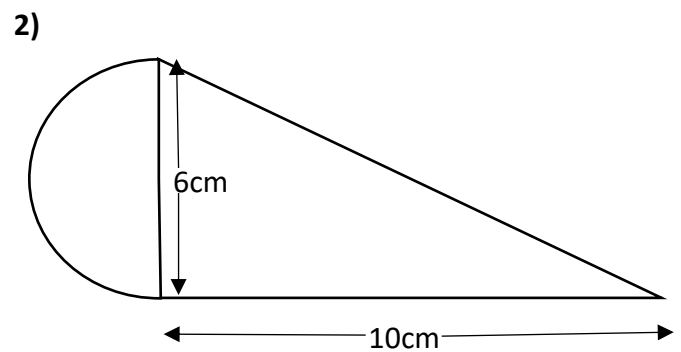* For a circle the circumference **is** the perimeter!
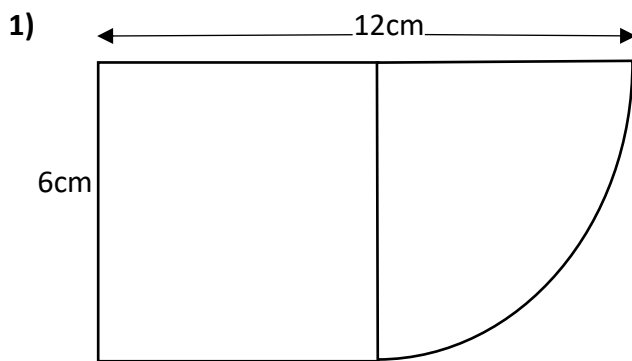
Area of compound shapes

Area of triangle = ½ × base × height
        = 0.5 × 8 × 6
        = 24cm²

Diameter = 8cm so radius of half circle = 4cm

Area of ½ circle = ½ × π × r²
        = 0.5 × 3.14 × 4²
        = 25.12cm²
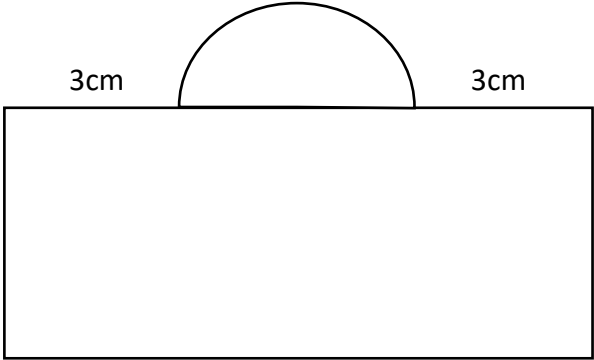
Total area = 24 + 25.12
        = 49.12 cm²

6cm

8cm

Now try to find the area of the shapes below: -

1)

12cm

6cm

2)

6cm

10cm

3)

3cm   3cm

4cm

10cm

4)

6cm

4cm

Continued below ↓

Perimeter of compound shapes

3cm   3cm

4cm
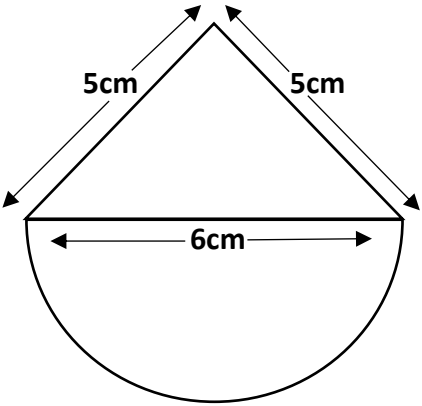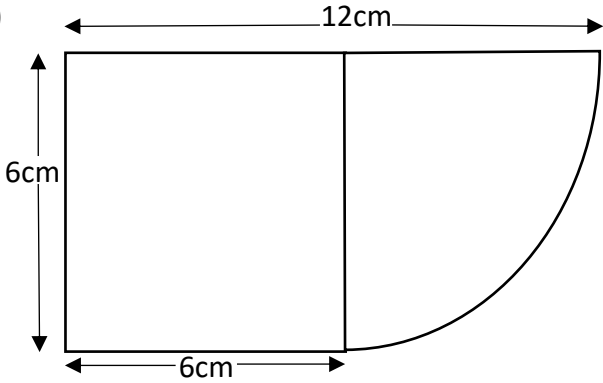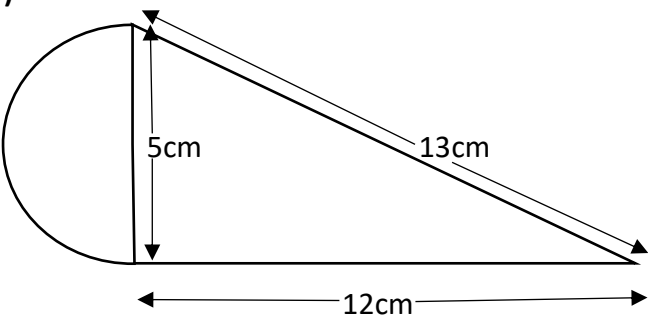
10cm

Diameter of half circle = 10 − (3 + 3) = 4cm

Length of curved part = ½ × π × 4
                      = 0.5 × 3.14 × 4
                      = 6.28cm

Perimeter = 3 + 4 + 10 + 4 + 3 + 6.28
          = 30.28cm

Now try to find the perimeter of the shapes below: -

1)

5cm   5cm

6cm

2)

12cm

6cm

6cm

3)

5cm   13cm

12cm

4)

5cm   4cm

3cm