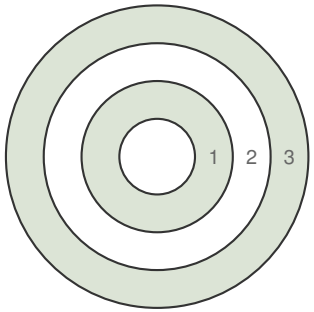
Take $\pi = 3.14$, or use the π key. Give answers to one decimal place.

1 A target is made from four circles with the same centre. The inner circle has radius 2 cm, and each circle after it is 2 cm bigger.



(a) Write down the four radii (1)

(b) Find the area of ring 1 (2)

(c) Find the area of ring 2 (2)

(d) Find the area of ring 3 (2)

(e) **Every ring is 2 cm wide. Explain why they do not have the same area.** (2)

(9 marks)

2 A shape is made from a square of side 10 cm with a semicircle added on one side and a quarter circle of radius 10 cm removed from the opposite corner.

(a) Find the area of the square (1)

(b) Find the area of the semicircle added (2)

(c) Find the area of the quarter circle removed (2)

(d) Find the total area of the shape (1)

(6 marks)

3 **Beyond the syllabus – try it if you have time.** Pythagoras' theorem says that for a right-angled triangle, the square on the hypotenuse equals the sum of the squares on the other two sides. A right-angled triangle has sides 3 cm, 4 cm and 5 cm. Instead of squares, a *semicircle* is drawn on each side, with that side as its diameter.

(a) Find the area of the semicircle on the 3 cm side (2)

(b) Find the area of the semicircle on the 4 cm side (2)

(c) Find the area of the semicircle on the 5 cm side (2)

(d) **Does Pythagoras' theorem still work?** (2)

(8 marks)