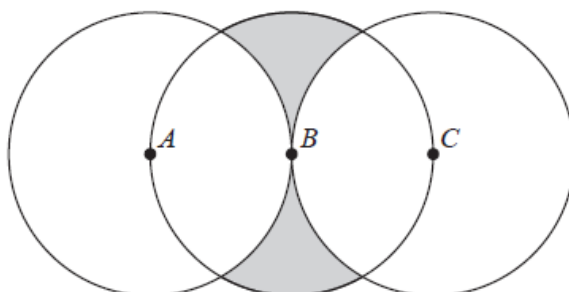


Mixed Exercise 6

1.

The diagram shows three circles, each of radius 4 cm.

The centres of the circles are A , B and C such that ABC is a straight line and $AB = BC = 4$ cm.



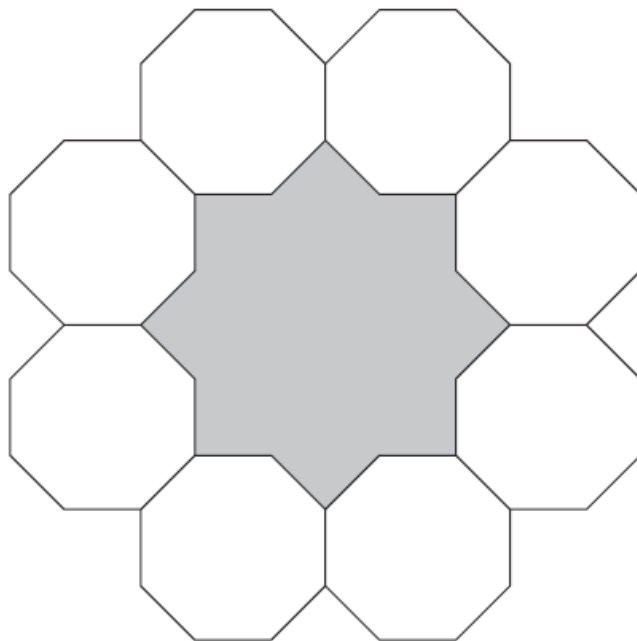
Work out the total area of the two shaded regions.

Give your answer in terms of π

..... cm^2
(5)

2.

The diagram shows 8 identical regular octagons joined to enclose a shaded shape.



Each octagon has sides of length a .

Find, in terms of a , an expression for the area of the shaded shape.

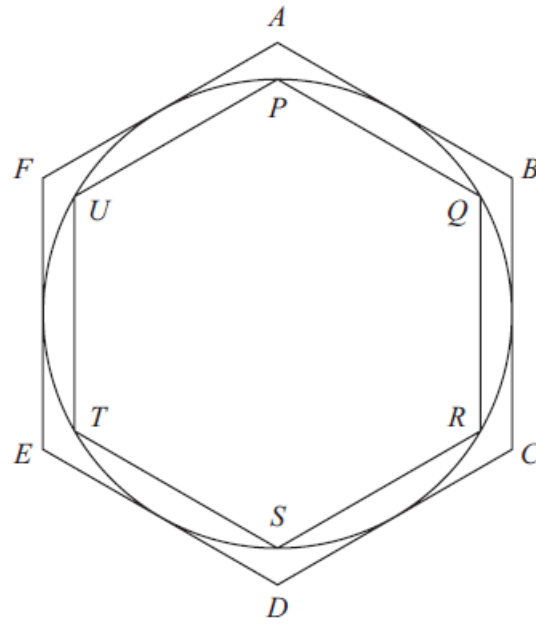
Give your answer in the form $p(2 + \sqrt{2})a^2$ where p is an integer.

You must show all your working.

(5)

3.

The diagram shows a circle, radius r cm and two regular hexagons.



Each side of the larger hexagon $ABCDEF$ is a tangent to the circle.
Each side of the smaller hexagon $PQRSTU$ is a chord of the circle.

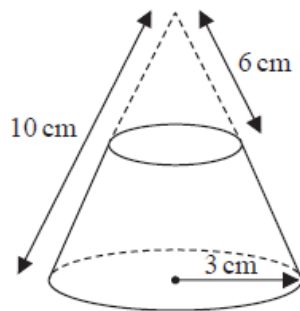
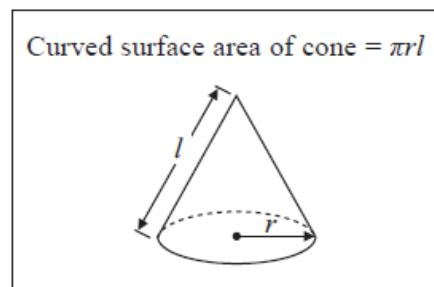
By considering perimeters, show that

$$3 < \pi < 2\sqrt{3}$$

(4)

4.

A solid frustum is made by removing a small cone from a large cone as shown in the diagram.



The slant height of the small cone is 6 cm.

The slant height of the large cone is 10 cm.

The radius of the base of the large cone is 3 cm.

Calculate the total surface area of the frustum.

Give your answer correct to 3 significant figures.

..... cm^2
(5)