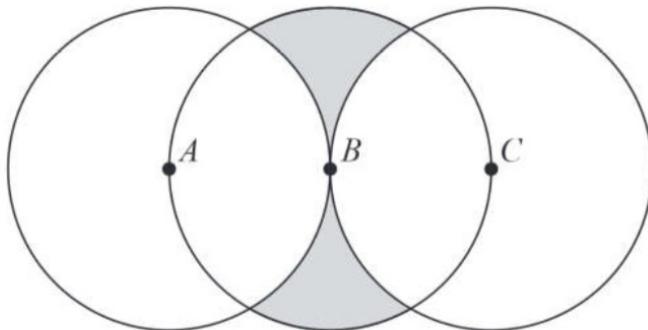


**Question 1 (5 Marks)**

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  $\pi$

.....  $\text{cm}^2$

**Question 2 (6 Marks)**

The functions  $f$  and  $g$  are such that

$$f(x) = 3x^2 + 1 \quad \text{for } x > 0 \quad \text{and} \quad g(x) = \frac{4}{x^2} \quad \text{for } x > 0$$

(a) Work out  $gf(1)$

.....  
(2)

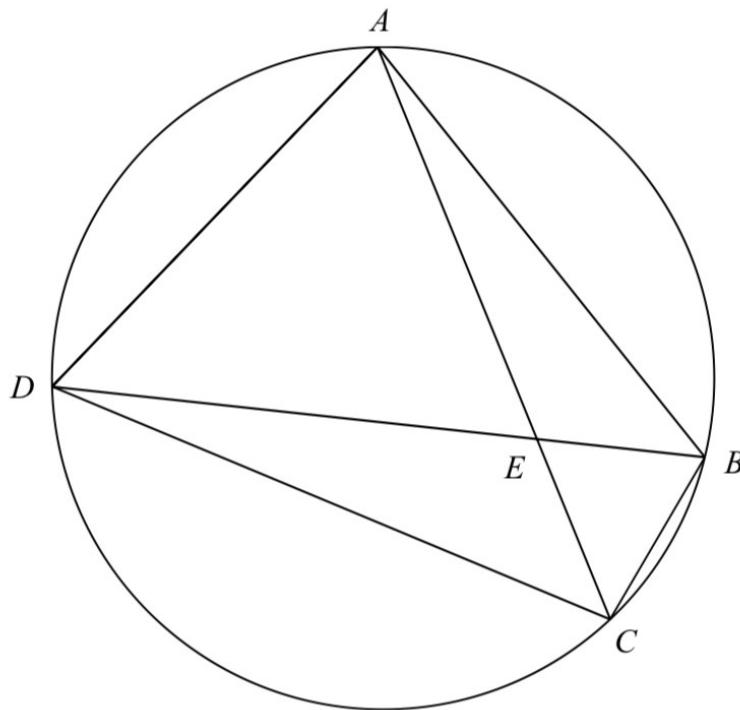
The function  $h$  is such that  $h = (fg)^{-1}$

(b) Find  $h(x)$

.....  
(4)

**Question 3 (4 Marks)**

$A, B, C$  and  $D$  are four points on a circle.



$AEC$  and  $DEB$  are straight lines.

Triangle  $AED$  is an equilateral triangle.

Prove that triangle  $ABC$  is congruent to triangle  $DCB$ .