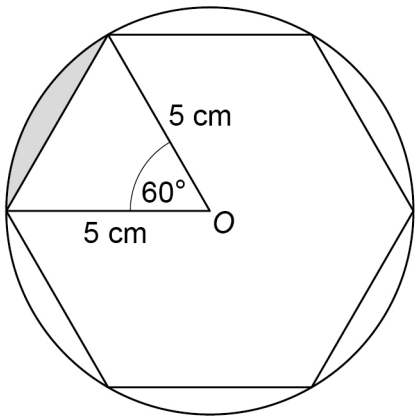
1 The vertices of a regular hexagon lie on a circle with centre O and radius 5 cm

Not drawn accurately



Work out the shaded area.

Give your answer in the form $\dfrac{a\pi - b\sqrt{c}}{12}$ where a, b and c are integers.

[4 marks]

Area of triangle $= \frac{1}{2} \times 5^2 \times \sin 60^\circ = \frac{25}{2} \times \frac{\sqrt{3}}{2}$

$= \frac{25\sqrt{3}}{4}$ (1)

Area of sector $= \pi \times 5^2 \times \frac{60}{360} = \frac{25\pi}{6}$ (1)

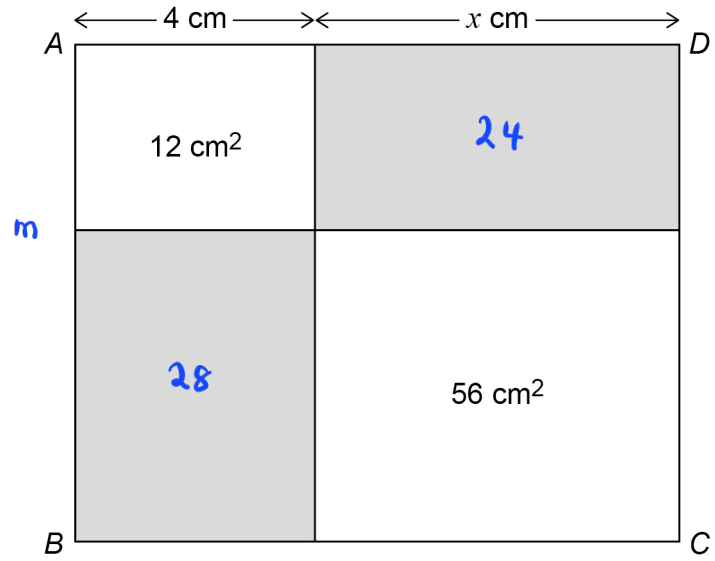
Area of shaded region $= \frac{(25\pi)\times 2}{6\times 2} - \frac{(25\sqrt{3})\times 3}{(4)\times 3}$ (1)

$= \frac{50\pi - 75\sqrt{3}}{12}$ (1)

Answer $\dfrac{50\pi - 75\sqrt{3}}{12}$ cm^2

2 Rectangle *ABCD* is split into four smaller rectangles.

Two of the smaller rectangles are shaded.



Not drawn accurately

$4 : x = 1 : 2$

For rectangle *ABCD*, work out the ratio shaded area : unshaded area

Give your answer in its simplest form.

[4 marks]

$x = 4 \times 2 = 8$

Area of top shaded rectangle : $8 \times (12 \div 4)$

$= 8 \times 3 = 24 \text{ cm}^2$ (1)

Area of bottom shaded rectangle : $4 \times (56 \div 8)$

$= 4 \times 7 = 28 \text{ cm}^2$ (1)

shaded : $24 + 28 = 52$ (1) unshaded : $12 + 56 = 68$

shaded : unshaded = $52 : 68$ ÷4

$= 13 : 17$

Answer 13 : 17 (1)