

LC 2014 (SET C): PAPER 2

QUESTION 5 (25 MARKS)

Question 5 (a)

$$\text{Area} = l \times l = l^2 = 81 \text{ cm}^2$$

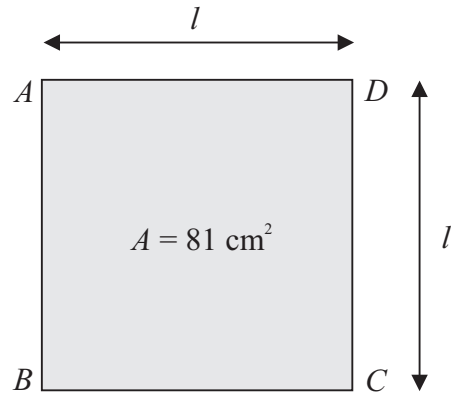
$$|AD| = l = \sqrt{81} = 9 \text{ cm}$$

MARKING SCHEME NOTES

Question 5 (a) [Scale 5B (0, 3, 5)]

3: • Works to $x^2 = 81$ or $x = \sqrt{81}$ and stops

NOTE: A correct answer without work shown award full credit



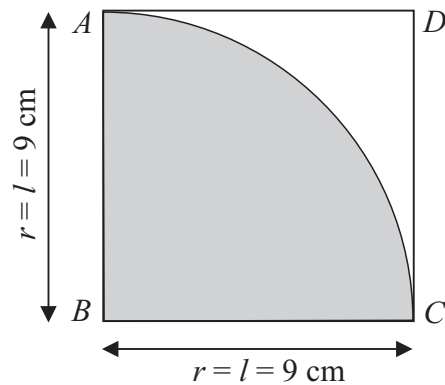
Question 5 (b) (i)

The area of the sector shown is one-quarter the area of a full circle.

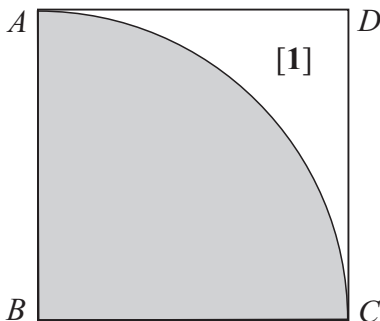
Area of a circle $A = \pi r^2$

$$|AC| = r = 9 \text{ cm}$$

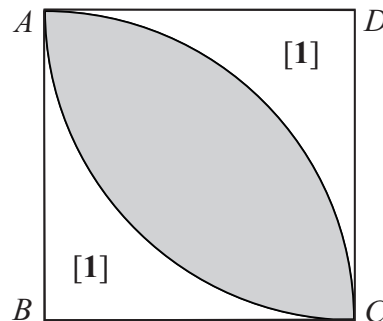
$$\text{Area} = \frac{1}{4} \times \pi(9)^2 = 63.6 \text{ cm}^2$$



Question 5 (b) (ii)



$$\begin{aligned} \text{Area of region [1]} &= \text{Area of square} - \text{Area of sector} \\ &= 81 - 63.6 = 17.4 \text{ cm}^2 \end{aligned}$$



$$\begin{aligned} \text{Area of overlap} &= \text{Area of square} - 2(\text{Area of region [1]}) \\ &= 81 - 2(17.4) = 46.2 \text{ cm}^2 \end{aligned}$$

MARKING SCHEME NOTES

Question 5 (b) (i) [Scale 10C (0, 4, 7, 10)]

- 4: • Writes the correct formula for the sector area or area of circle
 • Any correct or consistent substitution into formula
 • Any work of merit e.g. $r = 9$ or Answer (a)
- 7: • Formula substituted correctly
 • Calculates area of sector with one incorrect substitution
 • Correct or consistent answer expressed in terms of π
- 10: • Accept correct answers without work

Question 5 (b) (ii) [Scale 5B (0, 3, 5)]

- 3: • Calculates a relevant area. e.g. Unshaded area worked as $(81 - 63 \cdot 64)$ or similar and stops
 • Concept of shaded area by difference indicated but not fully developed
- Note:** Accept an answer consistent with previous work

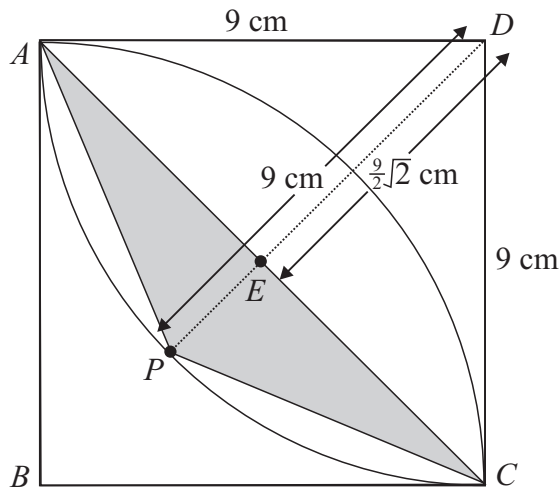
Question 5 (c)

E is the midpoint of $[AC]$, the point where the diagonals of the square intersect. Triangle ADC is a right-angled triangle. Apply Pythagoras' theorem.

$$|AC|^2 = 9^2 + 9^2 = 81 + 81 = 162$$

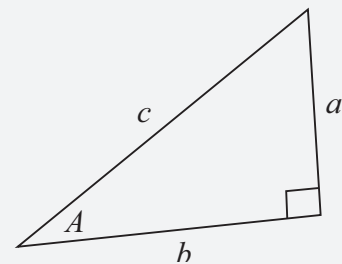
$$\therefore |AC| = \sqrt{162} = 9\sqrt{2} \text{ cm}$$

$$|AE| = |ED| = \frac{9}{2}\sqrt{2} \text{ cm}$$



FORMULAE AND TABLES BOOK

Trigonometry (page 16)
 Pythagoras' theorem



$$c^2 = a^2 + b^2$$

Area of $\triangle APC = \frac{1}{2}|AC||EP|$ Area = $\frac{1}{2}bh$

$$|AC| = 9\sqrt{2}$$

$$|EP| = 9 - \frac{9}{2}\sqrt{2}$$

$$\therefore \text{Area of } \triangle APC = \frac{1}{2}(9\sqrt{2})(9 - \frac{9}{2}\sqrt{2}) = 16 \cdot 8 \text{ cm}^2$$

MARKING SCHEME NOTES

Question 5 (c) [Scale 5A (0, 5)]

- 5: • Correct answer
- NOTE:** Accept an answer consistent with previous work