

LC 2013 (SET D): PAPER 2

QUESTION 5 (25 MARKS)

Question 5 (a)

Use a scale from the grid of 5 mm for each square.
The length of the rectangle is equal to the length of the circumference of the circle.

$$l = 2\pi r$$

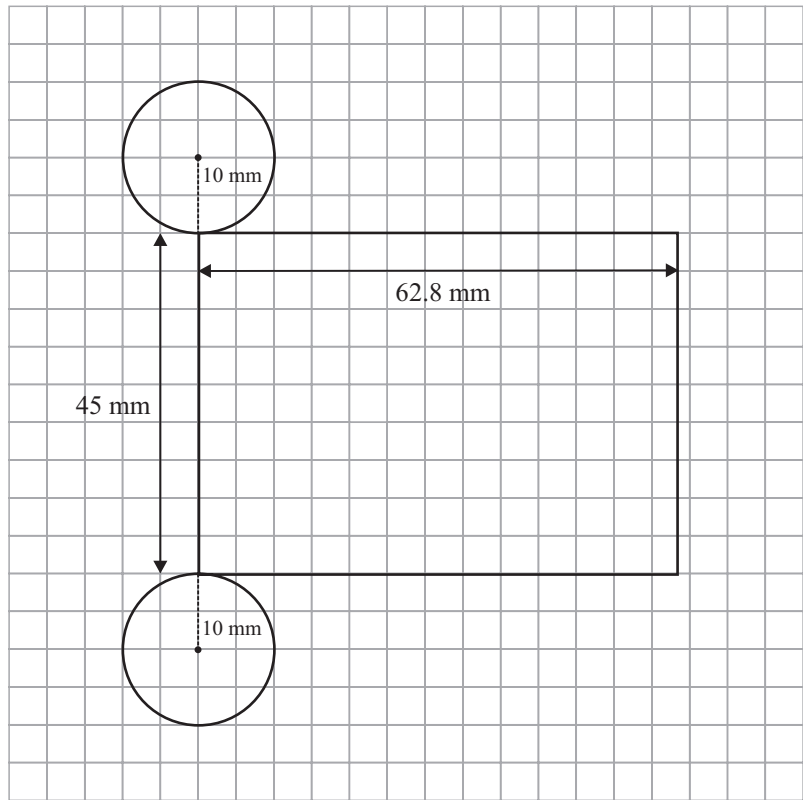
$$l = 2\pi(10) = 20\pi = 62.8 \text{ mm}$$

MARKING SCHEME NOTES

Question 5 (a)

[Scale 5C* (0, 3, 4, 5)]

- 3: • A rectangle or a circle drawn
• The length of the circle calculated
- 4: • A correct sketch drawn without dimensions
• A partially complete sketch drawn with some dimensions given
* Penalise one mark for incorrect or omitted units, provided full marks otherwise



Question 5 (b)

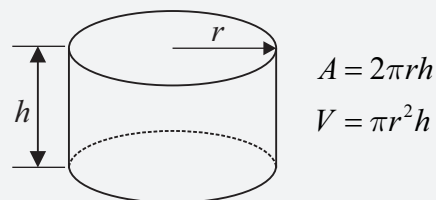
Volume V of a cylinder: $r = 10 \text{ mm}$, $h = 45 \text{ mm}$

$$V = \pi r^2 h = \pi(10)^2(45) = 4500\pi \text{ mm}^3$$

FORMULAE AND TABLES BOOK

Surface area and volume:

Cylinder [page 10]



Question 5 (c)

Volume of cylinder = Volume of sphere

$$4500\pi = \frac{4}{3}\pi r^3$$

$$\frac{3 \times 4500}{4} = r^3$$

$$3375 = r^3$$

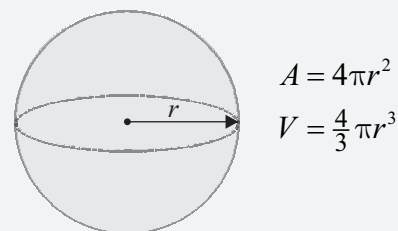
$$r = \sqrt[3]{3375} = 15 \text{ mm}$$

$$A = 4\pi r^2 = 4\pi(15)^2 = 900\pi \text{ mm}^2$$

FORMULAE AND TABLES BOOK

Surface area and volume:

Sphere [page 8]



MARKING SCHEME NOTES

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

- 4:**
- Correct formula for the volume of a cylinder written and stops
 - An incorrect relevant formula and some correct substitution.
- 7:**
- Formula substituted correctly without calculation or with incorrect calculation
 - Some incorrect substitution into formula with correct calculation
 - Correct answer not expressed in terms of π
- * Penalise one mark for incorrect or omitted units, provided full marks otherwise
- NOTE:** A correct answer without work shown, award full credit

Question 5 (c) [Scale 10D* (0, 2, 5, 8, 10)]

- 2:**
- Writes correct formula for the volume or surface area of a sphere
 - Equates volume of cylinder with surface area of sphere
- 5:**
- Equates volume of cylinder with volume of sphere
 - Equates volume of cylinder with surface area of sphere and correctly calculates r
- 8:**
- Calculates the radius of the sphere
 - Calculates correctly an incorrect surface area
 - Calculates the correct surface area with an incorrect radius
 - Correct answer not expressed in terms of π
- * Penalise one mark for incorrect or omitted units, provided full marks otherwise
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