

LC 2018: PAPER 2

QUESTION 8 (50 MARKS)

Question 8 (a)

$$|RQ|^2 + 3 \cdot 3^2 = 6 \cdot 5^2$$

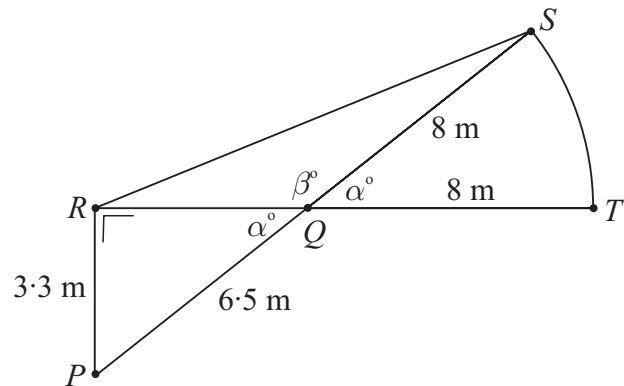
$$|RQ| = \sqrt{6 \cdot 5^2 - 3 \cdot 3^2} = 5.6 \text{ m}$$

Question 8 (b)

$$\sin \alpha = \frac{3 \cdot 3}{6 \cdot 5} \Rightarrow \alpha = \sin^{-1} \left(\frac{3 \cdot 3}{6 \cdot 5} \right) \approx 31^\circ$$

Question 8 (c)

$$\beta = 180^\circ - 31^\circ = 149^\circ \text{ [Straight angle]}$$



MARKING SCHEME NOTES

Question 8 (a) [Scale 10C (0, 3, 7, 10)]

- 3: • Correct relevant formula with some substitution
- 7: • Correct formula fully substituted
- Answer as $\sqrt{31 \cdot 36}$
 - Correct answer without work

Question 8 (b) [Scale 10C (0, 3, 7, 10)]

- 3: • Correct trigonometric ratio with some correct or consistent substitution
- 7: • $\sin \alpha = \frac{3 \cdot 3}{6 \cdot 5}$ (or similar).
- Finds $|\angle QPR| = 59^\circ$ and stops
 - Incorrect Calculator Mode (once only) [Rad = 1, Grad = 34]

Question 8 (c) [Scale 5B (0, 2, 5)]

- 2: • Any work of merit
- 5: • Correct answer without work

Question 8 (d)

$$|RS|^2 = 8^2 + 5 \cdot 6^2 - 2(8)(5 \cdot 6) \cos 149^\circ$$

$$|RS| = \sqrt{8^2 + 5 \cdot 6^2 - 2(8)(5 \cdot 6) \cos 149^\circ} \approx 13 \text{ m}$$

Question 8 (e)

$$|TS| = \frac{31^\circ}{360^\circ} \times 2\pi(8) \approx 4.3 \text{ m}$$

Question 8 (f)

$$\text{Area of sector } SQT = \frac{31^\circ}{360^\circ} \times \pi(8)^2 \approx 17.3 \text{ m}^2$$

MARKING SCHEME NOTES

Question 8 (d) [Scale 15D (0, 4, 7, 11, 15)]

- 0:** • Treats triangle as right angled/Sine Rule
4: • Any work of merit to identify the correct side required (Pilot Diagram)
 • Correct relevant formula with some correct or consistent substitution
7: • Two relevant variables correctly substituted into correct relevant formula and stops
11: • Fully correct substitution
 • Correct answer without work (13)
 • Incorrect Calculator Mode (once only)
 [Rad = 115, Grad = 158]

Question 8 (e) [Scale 5C (0, 2, 3, 5)]

- 2:** • Correct relevant formula with some correct or consistent substitution
3: • Correct formula fully substituted

$$2\pi(8) \times \frac{31}{360}$$

Question 8 (f) [Scale 5C (0, 2, 3, 5)]

- 2:** • Correct relevant formula with some substitution
3: • Correct formula fully substituted

$$\pi(8)^2 \times \frac{31}{360}$$