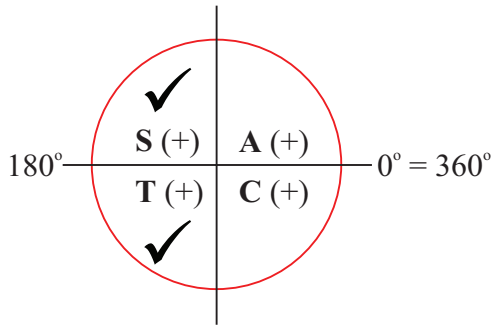


LC 2018: PAPER 2

QUESTION 4 (25 MARKS)

Question 4 (a)

$$\cos 2x = -\frac{\sqrt{3}}{2}, 0^\circ \leq x \leq 360^\circ$$



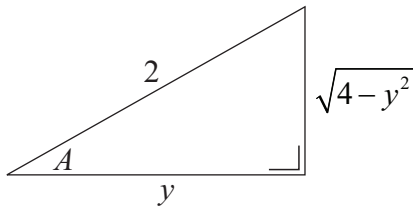
$$\text{Reference angle: } 2x = \cos^{-1} \left| -\frac{\sqrt{3}}{2} \right| = 30^\circ$$

$$2x = \begin{cases} 180^\circ - 30^\circ = 150^\circ, 510^\circ & \text{[2nd quadrant]} \\ 180^\circ + 30^\circ = 210^\circ, 570^\circ & \text{[3rd quadrant]} \end{cases}$$

$$x = \begin{cases} 75^\circ, 255^\circ \\ 105^\circ, 285^\circ \end{cases}$$

$$x = 75^\circ, 105^\circ, 255^\circ, 285^\circ$$

Question 4 (b)



$$\cos A = \frac{y}{2} \Rightarrow \sin A = \frac{\sqrt{4-y^2}}{2}$$

$$\begin{aligned} \sin 2A &= 2 \sin A \cos A = 2 \times \frac{y}{2} \times \frac{\sqrt{4-y^2}}{2} \\ &= \frac{y\sqrt{4-y^2}}{2} \end{aligned}$$

MARKING SCHEME NOTES

Question 4 (a) [Scale 20C (0, 7, 13, 20)]

7: • 0° or 150° or 210°

13: • 2 relevant values of x

Question 4 (b) [Scale 5C (0, 2, 4, 5)]

2: • $\sqrt{4-y^2}$

• $2\sin A \cos A$ without substitution

• $\sin 2A$ expressed in $\tan A$ format

• Relevant labelled diagram (2, y , A)

4: • Substitution for $\sin A$ or $\cos A$ in formula

• $\sin A = \left(\frac{\sqrt{4-y^2}}{2} \right)$

• $\tan A = \left(\frac{\sqrt{4-y^2}}{y} \right)$