LC 2014: Paper 2

Question 2 (25 marks)

Question 2 (a)

Replace angle B by A in the formula from the table book:

$\cos(A+B) = \cos A \cos B - \sin A \sin B$

$\cos(A+A) = \cos A \cos A - \sin A \sin A$

$\cos 2A = \cos^2 A - \sin^2 A$

Formulae and Tables Book
Trigonometry:
Compound angle formulae [page 14]

$\cos(A+B) = \cos A \cos B - \sin A \sin B$

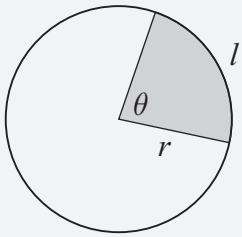
$\sin(A+B) = \sin A \cos B + \cos A \sin B$

$\tan(A+B) = \dfrac{\tan A + \tan B}{1 - \tan A \tan B}$

Marking Scheme Notes
Question 2 (a) [Scale 15C (0, 5, 10, 15)]
5: • Relevant compound angle formula
• Tested with one or more values for A
10: • Expansion correct but not tidied

Question 2 (b)

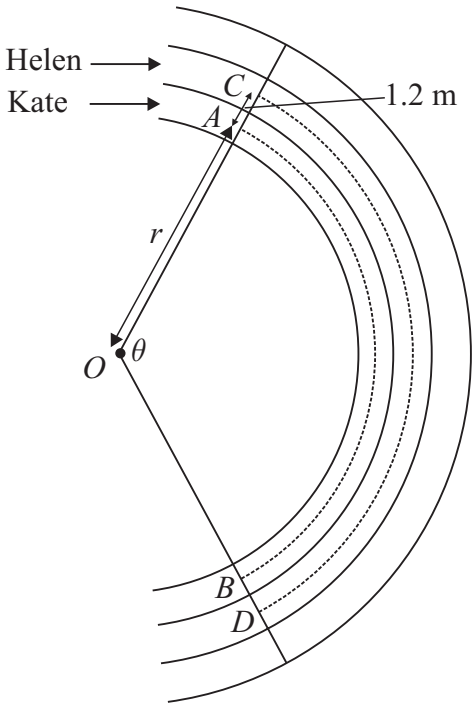
Formulae and Tables Book
Length and area:
Arc/sector [page 9]



$l = r\theta$

$A = \frac{1}{2} r^2 \theta$

when θ is in radians.



Call r the distance $|OA|$.

$|AB| + 3 = |CD|$

$|AB| = r\theta$....(**1**)

$|CD| = (r + 1 \cdot 2)\theta \Rightarrow |AB| + 3 = r\theta + 1 \cdot 2\theta$....(**2**)

$(\mathbf{2}) - (\mathbf{1}) : 3 = 1 \cdot 2\theta \Rightarrow \theta = \dfrac{3}{1 \cdot 2} = 2 \cdot 5$ radians

Marking Scheme Notes
Question 2 (b) [Scale 10D (0, 2, 5, 8, 10)]
2: • Correct formula for finding either arc
5: • One or both arcs expressed correctly
8: • θ not fully evaluated
• $|CD| - |AB| = 3$ or equivalent statement
• Substantially correct with one non arithmetic error