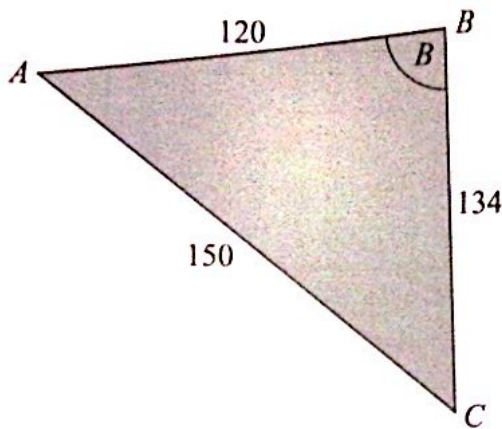# LC 2014 (Set B): Paper 2

Question 1 (25 marks)
Question 1 (a) (i)

$$150^2 = 120^2 + 134^2 - 2(120)(134)\cos B$$
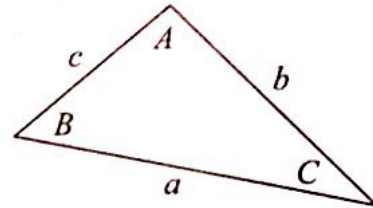
$$2(120)(134)\cos B = 120^2 + 134^2 - 150^2$$

$$B = \cos^{-1}\left(\frac{120^2 + 134^2 - 150^2}{2(120)(134)}\right) = 72 \cdot 15^\circ$$

Question 1 (a) (ii)

$$\text{Area} = \tfrac{1}{2}(120)(134)\sin 72\cdot15^\circ = 7653 \text{ m}^2$$

FORMULAE AND TABLES BOOK
Trigonometry of the triangle:
[page 16]

Area: $\tfrac{1}{2}ab\sin C$

Sine Rule: $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

Cosine rule: $a^2 = b^2 + c^2 - 2bc\cos A$

MARKING SCHEME NOTES
Question 1 (a) (i) [Scale 15D (0, 4, 7, 11, 15)]
4: • Identifies Cosine Rule formula
7: • All values correctly inserted
11: • Cos ($\angle CBA$) evaluated but angle not found
   • Substantially correct work with one non arithmetic error

Question 1 (a) (ii) [Scale 5C (0, 2, 3, 5)]
2: • Relevant area formula
   • Effort at finding a perpendicular height
3: • Substantially correct work with one non arithmetic error
   • Values correctly inserted

Question 1 (b)
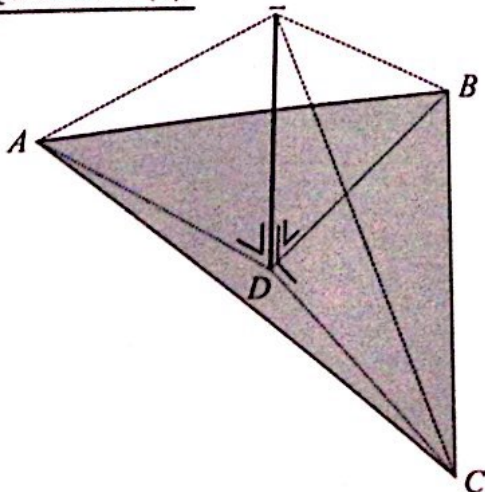
Triangles EDA, EDB and EDC are congruent because (SAS):
• $|AD| = |BD| = |CD|$ [D is the circumcentre]
• $|ED|$ is common to all 3 triangles
• $|\angle EDA| = |\angle EDB| = |\angle EDC| = 90^\circ$
Therefore, $|AE| = |BE| = |CE|$.

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