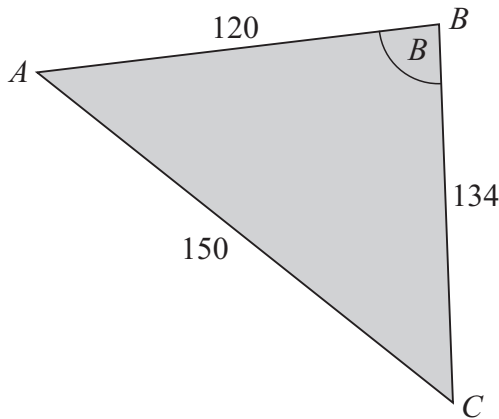


LC 2014: PAPER 2

QUESTION 1 (25 MARKS)

Question 1 (a) (i)



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

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

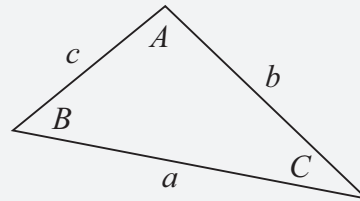
$$B = \cos^{-1}\left(\frac{120^2 + 134^2 - 150^2}{2(120)(134)}\right) = 72.15^\circ$$

Question 1 (a) (ii)

$$\text{Area} = \frac{1}{2}(120)(134)\sin 72.15^\circ = 7653 \text{ m}^2$$

FORMULAE AND TABLES BOOK
Trigonometry of the triangle:

[page 16]



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

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

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

MARKING SCHEME NOTES

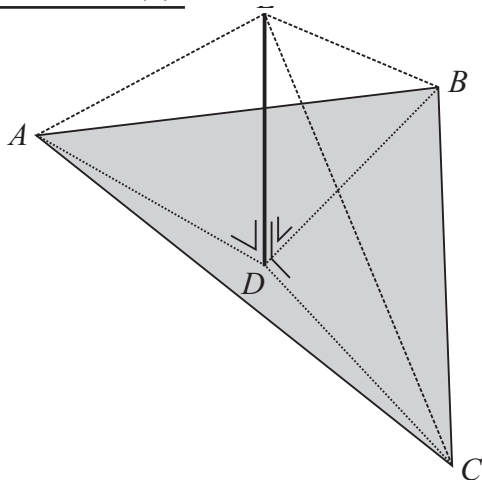
Question 1 (a) (i) [Scale 15D (0, 4, 7, 11, 15)]

- 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, $|AE| = |BE| = |CE|$.

MARKING SCHEME NOTES

Question 1 (b) [Scale 5C (0, 2, 3, 5)]

- 2:**
- Recognises $|AD| = |DB| = |DC|$ (any two)
 - Recognises one relevant right angle
 - Indicates some understanding of circumcentre of a triangle
- 3:**
- Recognises $|AD| = |DB| = |DC|$ and relevant right angles but fails to conclude fully
 - Clearly identifies two congruent triangles but does not make reference to the remaining triangle
-