05	3b	The lengths of the sides of a triangle are 7 cm, 8 cm and 13 cm. (i) Find the size of the angle opposite the longest side. (ii) Find the area of the triangle.	2 1

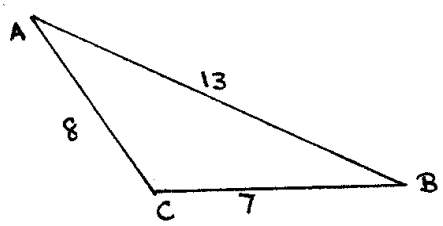
i. Using the cosine rule:

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$$= \frac{8^2 + 7^2 - 13^2}{2 \times 8 \times 7}$$

$$= -0.5$$

$$C = 120^\circ$$



The angle opposite the longest side is 120°

ii. Using Area $= \frac{1}{2}ab\sin C$

$$= \frac{1}{2} \times 8 \times 7 \times \sin 120^\circ$$

$$= \frac{1}{2} \times 8 \times 7 \times \frac{\sqrt{3}}{2}$$

The area is $14\sqrt{3}$ cm^2

* These solutions have been provided by *projectmaths* and are not supplied or endorsed by the Board of Studies

Board of Studies: Notes from the Marking Centre

(i) The majority of candidates applied the cosine rule to answer this question. However, many candidates used the cosine rule incorrectly or did not calculate the largest angle or could not evaluate $\cos\theta = -\frac{1}{2}$. Attempts to evade the negative sign by arbitrarily changing signs or introducing absolute value signs caused errors.

(ii) Most candidates were able to use $A = \frac{1}{2}ab\sin C$ and recognise that the angle C was the included angle.

Source: http://www.boardofstudies.nsw.edu.au/hsc_exams/