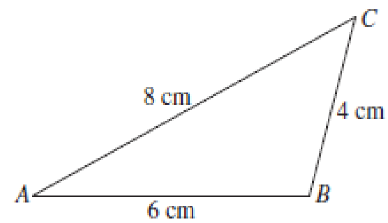
Want more revision exercises? Get **MathsFit** for \$2.95/topic - *New from projectmaths*

2015 13 a The diagram shows ΔABC with sides $AB = 6$ cm, $BC = 4$ cm and $AC = 8$ cm.



Not to scale

(i) Show that $\cos A = \dfrac{7}{8}$. **1**

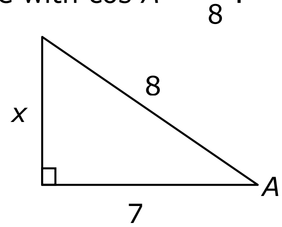
(ii) By finding the exact value of $\sin A$, determine the exact value of the area of ΔABC. **2**

(i) $$\cos A = \frac{8^2 + 6^2 - 4^2}{2 \times 8 \times 6}$$
$$= \frac{84}{96}$$
$$= \frac{7}{8}$$

State Mean: **0.77**

(ii)

Draw a triangle with $\cos A = \dfrac{7}{8}$:



Using Pythagoras' theorem, and letting unknown side be x:

$$x^2 = 8^2 - 7^2$$
$$= 15$$
$$x = \sqrt{15} \qquad (x > 0)$$
$$\therefore \sin A = \frac{\sqrt{15}}{8}$$

Now, area of $\Delta ABC = \dfrac{1}{2} bc \sin A$

$$= \frac{1}{2} \times 8 \times 6 \times \frac{\sqrt{15}}{8}$$
$$= 3\sqrt{15}$$

$\therefore$ the area is $3\sqrt{15}$ cm^2.

State Mean: **0.80**

* These solutions have been provided by *projectmaths* and are not supplied or endorsed by BOSTES.

Board of Studies: Notes from the Marking Centre

(a)(i) This part was generally done well by most candidates.

Common problems were:

- using an incorrect formula for the cosine rule
- incorrectly substituting into the correct formula
- attempting to find cos A using right triangle trigonometry.

(a)(ii) In better responses, candidates used the results from (a)(i), formed a right-angled triangle and used Pythagoras's Theorem to obtain the third side, allowing them to find the exact value of sin *A*.

Common problems were:

- using an incorrect formula for area
- correctly finding the exact value of sin A as $\frac{\sqrt{15}}{8}$ and then using this value as angle A in the area of a triangle formula
- finding the value of angle A and sin A using the calculator and giving an approximation for the area of the triangle
- not being able to find the exact value of sin A
- interpreting an exact value to mean 'round off to the nearest whole number'.