1 A, B and C are angles of an acute triangle.

(i) Show that $\sin C = \sin(A+B)$. [2]

Given that angle $A = 45°$ and angle $B = 60°$,

(ii) **Without using a calculator,** express $\sin 75°$ in the form of $\frac{\sqrt{p}}{q}\left(1+\sqrt{r}\right)$, where p, q and r are integers. [3]

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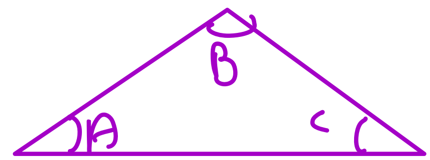
$A + B + C = 180°$

$A + B = 180° - C$

$\sin(A+B) = \sin(180° - C)$

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



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

$\sin(45° + 60°) = \sin 75°$

(addition formula)

$\sin 75° = \sin 45° \cos 60° + \cos 45° \sin 60°$

$\sin 75° = \frac{\sqrt{2}}{2} \times \frac{1}{2} + \frac{\sqrt{2}}{2} \times \frac{\sqrt{3}}{2}$

$\sin 75° = \frac{\sqrt{2}}{4}(1+\sqrt{3})$

Therefore $p = 2$, $q = 4$, $r = 3$