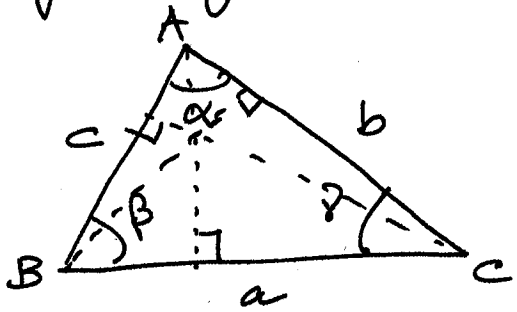
Sine Law of triangles visited :-



Note that :- $h_a = b\sin\gamma = c\sin\beta$.

& $h_b = a\sin\gamma = c\sin\alpha$.

& $h_c = a\sin\beta = b\sin\alpha$.

where h_a, h_b & h_c are the 3 normals.

$\therefore \frac{b}{\sin\beta} = \frac{c}{\sin\gamma} = \frac{a}{\sin\alpha}$ ← the sine law.

Question :- What do these ratios equal?

Note $A = \frac{1}{2}ah_a = \frac{1}{2}bh_b = \frac{1}{2}ch_c$ (A is the area of the Δ

$\therefore h_a = 2A/a$, $h_b = 2A/b$ & $h_c = 2A/c$

$\therefore \frac{2A}{a} = b\sin\gamma = c\sin\beta$

or $2A = ab\sin\gamma = ac\sin\beta$.

or $\frac{2A}{abc} = \frac{\sin\gamma}{c} = \frac{\sin\beta}{b}$

Similarly proceeding we can show that

$$\frac{a}{\sin\alpha} = \frac{b}{\sin\beta} = \frac{c}{\sin\gamma} = \left(\frac{abc}{2A}\right)$$