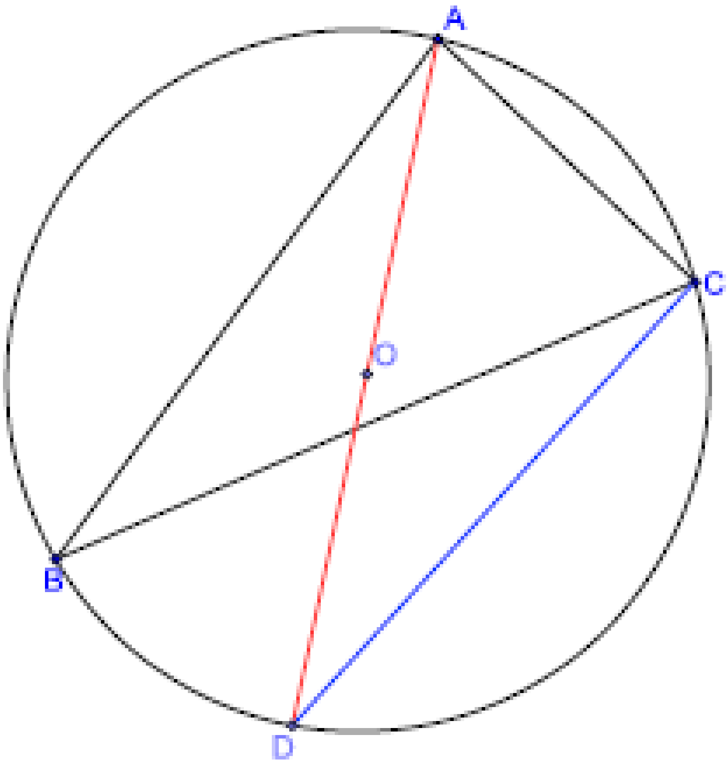

Begin by circumscribing a circle around the triangle in question, ABC. (A unique circle can be drawn through any three points). Construct diameter AOD and join CD. Let the radius be *r*.

Δ ACD is a triangle in a semicircle and therefore $\angle ACD = 90°$.

In right angled Δ ACD,

$$\sin D = AC/AD$$
$$\text{i.e. } \sin D = AC/2r \ldots\ldots(i)$$

As angle B = angle D (because they stand on same arc AC), (i) above may be written

$$\sin B = AC/2r$$
$$\text{so } 2r = AC/\sin B$$
$$\text{i.e. } \mathbf{2r = b/\sin B}$$

In a similar way, (drawing diameter from C etc) it can be shown that

$$2r = BC/\sin A$$
$$\text{i.e. } \mathbf{2r = a/\sin A}$$

and

$$2r = AB/\sin C$$
$$\text{i.e. } \mathbf{2r = c/\sin C}$$

We now have three expressions for 2r, therefore

$$a/\sin A = b/\sin B = c/\sin C$$