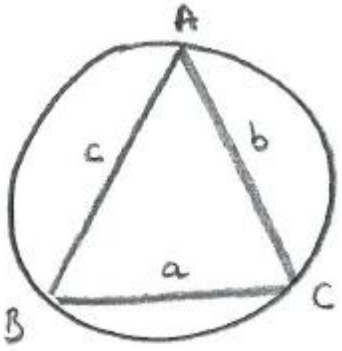
Geometry – Q6 [Problem/M](24/5/21)

ABC is a triangle circumscribed by a circle of radius R, as shown in the diagram below.



Show that (i) $\frac{a}{sinA} = 2R$ (ii) the area of the triangle is $\frac{abc}{4R}$

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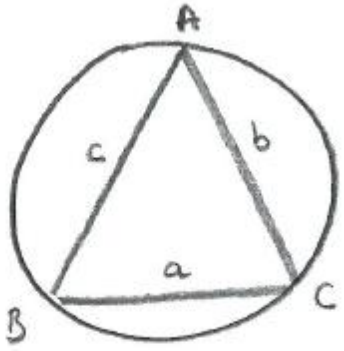

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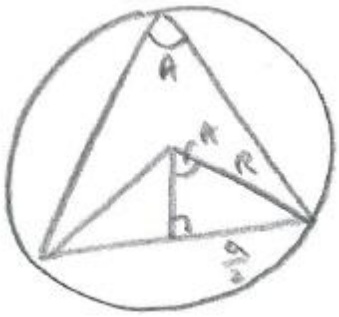
Solution

(i) Drawing radii from B and C to the centre of the circle, as in the diagram below, and noting that the angle at the centre is twice the angle at the circumference,

$\sin A = \frac{\left(\frac{a}{2}\right)}{R}$, so that $\frac{a}{sinA} = 2R$, as required



(ii) Area of $ABC = \frac{1}{2}bcsinA = \frac{1}{2}bc\left(\frac{a}{2R}\right) = \frac{abc}{4R}$