

Question 1. In a triangle with sides  $a, b, c$ ,  $r_1 > r_2 > r_3$  (which are the ex-radii), then

[AIEEE 2002]

(a)  $a > b > c$

(b)  $a < b < c$

(c)  $a > b$  and  $b < c$

(d)  $a < b$  and  $b > c$

Solution.

We know,

$$r_1 = \frac{\Delta}{s-a}, \quad r_2 = \frac{\Delta}{s-b}, \quad r_3 = \frac{\Delta}{s-c}$$

Given,  $r_1 > r_2 > r_3$

$$\Rightarrow \frac{\Delta}{s-a} > \frac{\Delta}{s-b} > \frac{\Delta}{s-c}$$

$$\Rightarrow (s-a) < (s-b) < (s-c)$$

$$\Rightarrow (-a) < (-b) < (-c)$$

$$\Rightarrow \boxed{a > b > c} \quad \underline{\text{Ans.}} \quad \text{Option (a)}$$