

Question. If in $\triangle ABC$, $\frac{2\cos A}{a} + \frac{\cos B}{b} + \frac{2\cos C}{c} = \frac{a}{bc} + \frac{b}{ca}$,

then the value of the angle A is ?

[IIT JEE 1994, 2]

Solution.

$$\frac{2\cos A}{a} + \frac{\cos B}{b} + \frac{2\cos C}{c} = \frac{a}{bc} + \frac{b}{ca}$$

$$\Rightarrow \frac{2(b^2 + c^2 - a^2)}{2abc} + \frac{c^2 + a^2 - b^2}{2abc} + \frac{2(a^2 + b^2 - c^2)}{2abc}$$

$$\Rightarrow \frac{a^2 + 3b^2 + c^2}{2abc} = \frac{a^2 + b^2}{abc}$$

$$\Rightarrow a^2 + 3b^2 + c^2 = 2a^2 + 2b^2$$

$$\Rightarrow b^2 + c^2 = a^2$$

\therefore The triangle is right angled at A.

$$\boxed{\angle A = 90^\circ}$$

Ans