

Mathematics

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(Chapter – 2) (Polynomials)(Exemplar Problems)

(Class – IX)

Exercise 2.4

Question 7:

If a, b, c are all non-zero and $a + b + c = 0$, prove that $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = 3$

Answer 7:

$$\begin{aligned}\text{LHS} &= \frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} \\ &= \frac{a^3 + b^3 + c^3}{abc} \\ &= \frac{(a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca) + 3abc}{abc} \\ & \quad [\because a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)] \\ &= \frac{0 \cdot (a^2 + b^2 + c^2 - ab - bc - ca) + 3abc}{abc} \\ &= \frac{3abc}{abc} = 3 \\ &= \text{RHS}\end{aligned}$$

