

$$\textcircled{8} \quad a+b+c=5 \quad (\text{given})$$

Squaring both sides

$$a^2+b^2+c^2+2(ab+bc+ca)=25$$

$$a^2+b^2+c^2+2 \times 10 = 25 \quad [\because ab+bc+ca=10 \text{ given}]$$

$$\Rightarrow a^2+b^2+c^2=5 \quad \dots \textcircled{1}$$

$$\text{LHS} = a^3+b^3+c^3-3abc$$

$$= (a+b+c)[a^2+b^2+c^2-(ab+bc+ca)]$$

$$= 5(5-10) \quad [\because a+b+c=5, \\ ab+bc+ca=10, \\ \text{and eqn i}]$$

$$= 5(-5)$$

$$= -25$$

$$= \text{RHS}$$

$$\textcircled{9} \quad \text{LHS} = (a+b+c)^3 - a^3 - b^3 - c^3$$

$$\text{Put } a+b=x$$

$$= (x+c)^3 - a^3 - b^3 - c^3$$

$$= x^3 + \cancel{c^3} + 3xc(x+c) - a^3 - b^3 - \cancel{c^3}$$

$$\text{Put } x = a+b$$

NCERT Exemplar Solutions by Dev Anoop (Bathinda)

$$= (a+b)^3 + 3(a+b)c(a+b+c) - a^3 - b^3$$

$$= \cancel{a^3} + \cancel{b^3} + 3ab(a+b) + 3(a+b)c(a+b+c) - \cancel{a^3} - \cancel{b^3}$$

$$= 3(a+b)[ab+c(a+b+c)]$$

$$= 3(a+b)(ab+ac+bc+c^2)$$

$$= 3(a+b)[a(b+c)+c(b+c)]$$

$$= 3(a+b)(b+c)(a+c)$$

$$= 3(a+b)(b+c)(c+a)$$

$$= \text{RHS}$$