

13

$$x + y + z = 0$$

$$\Rightarrow x + y = -z$$

Cubing both sides

$$x^3 + y^3 + 3xy(x+y) = (-z)^3$$

$$x^3 + y^3 + 3xy(-z) = (-z)^3$$

$$\Rightarrow x^3 + y^3 + z^3 = 3xyz$$

14 i $(-12)^3 + 7^3 + 5^3$

let $a = -12, b = 7, c = 5$

$$a + b + c = -12 + 7 + 5 = 0$$

$$\therefore (-12)^3 + 7^3 + 5^3$$

$$= 3(-12) \times 7 \times 5$$

$$= -1260$$

$$\left[\begin{array}{l} \because a + b + c = 0 \\ \therefore a^3 + b^3 + c^3 = 3abc \end{array} \right]$$

14 ii $28^3 + (-15)^3 + (-13)^3$

let $a = 28, b = -15, c = -13$

$$a + b + c = 28 + (-15) + (-13) = 0$$

$$28^3 + (-15)^3 + (-13)^3 = 3 \times 28 \times (-15) \times (-13) = -16380$$

15 i $25a^2 - 35a + 12$

$$= 25a^2 - 15a - 20a + 12$$

$$= 5a(5a - 3) - 4(5a - 3)$$

$$= (5a - 3)(5a - 4)$$

Possible expressions for length are

$$5a - 3, \quad 5a - 4$$

Possible expressions for breadth are

$$5a - 4, \quad 5a - 3$$