

Q1. Prove that :

(i) $x^3 - y^3 = (x - y)(x^2 + y^2 + xy)$ (ii) $a^3 - b^3 = (a - b)(a^2 + b^2 + ab)$

(iii) $x^3 + y^3 = (x + y)(x^2 + y^2 - xy)$ (iv) $a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$

Q2. Factorise :

(i) $27y^3 + 125z^3$ (ii) $64m^3 - 343n^3$ (iii) $a^3 + 27$ (iv) $y^3 + 125$ (v) $1 - 27a^3$ (vi) $1 + 64x^3$

(vii) $8y^3 - 125x^3$ (viii) $32a^3 + 108b^3$

(x) $16a^4 + 54a$ (xi) $a^7 - ab^6$

Ans. 2 (i) $(3y + 5z)(9y^2 + 25z^2 - 15yz)$ (ii) $(4m - 7n)(16m^2 + 49n^2 + 28mn)$ (iii) $(a + 3)(a^2 - 3a + 9)$

(iv) $(y + 5)(y^2 - 5y + 25)$ (v) $(1 - 3a)(1 + 3a + 9a^2)$ (vi) $(1 + 4x)(1 - 4x + 16x^2)$

(vii) $(2y - 5x)(4y^2 + 25x^2 + 10xy)$ (viii) $4(2a + 3b)(4a^2 - 6ab + 9b^2)$

(x) $2a(2a + 3)(4a^2 - 6a + 9)$ (xi) $a(a - b)(a + b)(a^2 + b^2 + ab)(a^2 + b^2 - ab)$

Q3. (i) If $a + b = 10$ and $ab = 21$, find the value of $a^3 + b^3$.

Ans. 370

(ii) If $x + y = 12$ and $xy = 27$, find the value of $x^3 + y^3$.

Ans. 756

(iii) If $a - b = 4$ and $ab = 45$, find the value of $a^3 - b^3$.

Ans. 604

(iv) If $3x + 2y = 20$ and $xy = \frac{11}{9}$, find the value of $27x^3 + 8y^3$.

Ans. 7560

Q4. If $\frac{x}{y} + \frac{y}{x} = -1$, then find the value of $x^3 - y^3$.

Ans. 0

