

1. Evaluate:  $101 \times 99$  using identities.
2. Find the remainder when  $x^3 - ax^2 + 5x - a$  is divided by  $x - a$ .
3. Find the value of  $ab + bc + ca$ , if  $a + b + c = 9$  and  $a^2 + b^2 + c^2 = 35$
4. Show that  $(2x + 1)$ ,  $(x - 3)$  and  $(3x + 1)$  are factors of the polynomial  $6x^3 - 13x^2 - 14x - 3$ .
5. Factorise:  $(3x + 4y)^2 + 2(3x + 4y)(3x - 4y) + (3x - 4y)^2$
6. The polynomials  $p(x) = ax^3 - 3x^2 + 4$  and  $q(x) = 2x^3 - 5x + a$  when divided by  $(x - 2)$  leaves remainder as  $p$  and  $q$ . If  $p - 2q = 4$ , find  $a$ .
7. Prove that  $(x - a)^3 + (x - b)^3 + (x - c)^3 - 3(x - a)(x - b)(x - c) = 0$ , when  $a + b + c = 3x$ .
8. Factorise:  $2x^3 - 9x^2 + x + 12$