EXERCISE 2.3

1. Divide the polynomial $p(x)$ by the polynomial $g(x)$ and find the quotient and remainder in each of the following :
   (i) $p(x) = x^3 - 3x^2 + 5x - 3$, $g(x) = x^2 - 2$
   (ii) $p(x) = x^4 - 3x^2 + 4x + 5$, $g(x) = x^2 + 1 - x$
   (iii) $p(x) = x^4 - 5x + 6$, $g(x) = 2 - x^2$
2. Check whether the first polynomial is a factor of the second polynomial by dividing the second polynomial by the first polynomial:
   (i) $t^2 - 3$, $2t^4 + 3t^3 - 2t^2 - 9t - 12$
   (ii) $x^2 + 3x + 1$, $3x^4 + 5x^3 - 7x^2 + 2x + 2$
   (iii) $x^3 - 3x + 1$, $x^5 - 4x^3 + x^2 + 3x + 1$
3. Obtain all other zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$.
4. On dividing $x^3 - 3x^2 + x + 2$ by a polynomial $g(x)$, the quotient and remainder were $x - 2$ and $-2x + 4$, respectively. Find $g(x)$.
5. Give examples of polynomials $p(x)$, $g(x)$, $q(x)$ and $r(x)$, which satisfy the division algorithm and
   (i) $\deg p(x) = \deg q(x)$ (ii) $\deg q(x) = \deg r(x)$ (iii) $\deg r(x) = 0$