# DIVISION OF POLYNOMIALS AND THE REMAINDER THEOREM

**1** Perform the following long divisions.

**(a)** $(3x^2 - 2x + 5) \div (x - 2)$

**(b)** $(x^3 - x^2 + x - 1) \div (x - 1)$

**(e)** $(x^3 - 27) \div (x - 3)$

**(k)** $(x^3 - 4x^2 + 2x + 3) \div (x^2 - x + 1)$

**5** $P(x) = x^4 - x^3 + px^2 - 4x + q$. Find $p$ and $q$ if $P(0) = 3$ and $P(-1) = 11$.

**6** $P(x) = ax^3 - 2x^2 + bx + c$. Find $a$, $b$ and $c$ if $P(0) = 12$, $P(-1) = 3$ and $P(2) = 36$.

**7** Using the remainder theorem, find the remainder when:

(a) $x^3 + 3x^2 + 2x - 7$ is divided by $(x + 2)$

(b) $3x^2 + 7x - 2$ is divided by $(x - 4)$

**10** When the polynomial $x^3 + 3x^2 - mx + n$ is divided by $(x + 2)$ the remainder is 9; when divided by $(x - 3)$ the remainder is 49. Find $m$ and $n$.

**13** When $2x^3 + 7x^2 + ax + b$ is divided by $(x-3)$ the remainder is 120; when divided by $(x+1)$ the remainder is $-8$. Find the values of $a$ and $b$.