

## Working With Polynomials

**Question 1.** Determine the degree of the following polynomials.

- a)  $x^3 + x^2 + 2x + 9$
- b)  $x - x^4 + x^2 + 5 - 3x + 2x^4$
- c)  $x^5 + x^6 + x - 10$
- d)  $3 - 2x + 4x^2 - 5x^3 + 7x^7$
- e)  $x + 5$
- f)  $34 + 10x^2 - 7xy + 2y^2$

**Question 2.** Multiply the following polynomials and simplify your answers as much as possible.

- a)  $(x + 2)(x + 3)$
- b)  $(2x + 1)(x - 2)$
- c)  $(x - 5)(x + 5)$
- d)  $(x + 1)(x - 4)(2x - 3)$
- e)  $(x^2 + 4x)(x - 2)$
- f)  $(x^2 + 3x + 1)(2x^2 - x - 1)$

**Question 3.** Divide the following polynomials by using long division.

- a)  $(x^3 + x^2 - 2x - 8) \div (x - 2)$
- b)  $(3x^4 + x^3 - 2x^2 + x) \div (x + 1)$
- c)  $(-2x^3 + 3x^2 + 9x - 2) \div (2x - 1)$
- d)  $(2x^4 - 6x^2 - 6) \div (x^2 + 1)$
- e)  $(x^4 + 2x^3 - 1) \div (x^2 + x - 2)$

**Question 4.** Divide the following polynomials by using synthetic division.

- a)  $(x^3 - 1) \div (x - 1)$
- b)  $(2x^3 + 5x^2 - x) \div (x + 2)$
- c)  $(x^4 + 4x^3 - 3x^2 + 15x + 20) \div (x + 5)$
- d)  $(3x^4 - 11x^3 + 5x^2 + 10x - 11) \div (x - 3)$
- e)  $(5x^5 - 20x^4 - x^2 + 14x - 40) \div (x - 4)$

*You can check your answers on page 276.*