

## Working with polynomials

### Starter

1. **(Review of previous material)** Expand and simplify:

(a)  $(2x - 5)(3x + 4)$

(b)  $(6x - 7)(9x^2 - x + 4)$

### Notes

A **polynomial** in  $x$  is a function of the form:  $a_0 + a_1x + a_2x^2 + a_3x^3 + \dots$

Notice that the powers are all integers **greater than or equal to zero**.

The  $a_n$  are the **coefficients** of the terms.

The **degree of a polynomial** is the highest power to which the unknown is raised. For example, a quadratic function  $f(x) = ax^2 + bx + c$  has degree 2.

The coefficient of the term whose power is highest is called the **leading coefficient**. The term containing the highest power of  $x$  is called the **leading order term**.

Polynomials with:

- degree 0 are called **constant** polynomials,
- degree 1 are called **linear** polynomials,
- degree 2 are called **quadratic** polynomials,
- degree 3 are called **cubic** polynomials,
- degree 4 are called **quartic** polynomials,
- degree 5 are called **quintic** polynomials,

**E.g. 1** Decide whether each of the following is a polynomial. If so, state its degree.

(a)  $f(x) = 4x^5 + \frac{3}{x^2}$

(b)  $f(x) = 7x^3 - 2x + 8$

(c)  $f(x) = 59$

Video: [Polynomials](#)

[Solutions to Starter and E.g.s](#)

### Exercise

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### Summary

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