

Algebra 1

chapter

1

Section 1.1 Polynomial expressions

$$\text{Polynomials} \quad \left\{ \begin{array}{l} \text{Linear} : ax+b \\ \text{Quadratic} : ax^2+bx+c \\ \text{Cubic} : ax^3+bx^2+cx+d \end{array} \right. \\ \text{eg...}$$

PROJECT MATHS
Text & Tests 6


1. Addition and subtraction of polynomial expressions

Example 1

Expand and simplify each of the following expressions.

(i) $7(x^3 + 2x^2 - 5x) - 2(2 + 3x + 4x^2 - 2x^3)$

(ii) $3x^2(4x^2 - 5x + 6) + 4x(8x^3 - 2x - 3)$

expand

(i)

$7x^3 + 14x^2 - 35x - 4 - 6x - 8x^2 + 4x^3$

simplify

$11x^3 + 6x^2 - 41x - 4$

2. Multiplying polynomial expressions

Example 2

Simplify the following: $(x - 5)(2x^2 - 3x + 6)$

expand

simplify

$$x(2x^2 - 3x + 6) - 5(2x^2 - 3x + 6)$$

$$= 2x^3 - 3x^2 + 6x - 10x^2 + 15x - 30$$

$$= 2x^3 - 13x^2 + 21x - 30$$

3. Perfect squares

Example 3

Given that $25x^2 + px + 16$ is a perfect square and $p > 0$, find the value of p .Perfect
Square

| | | |
|------|----------------|----------------|
| | $5x$ | $+4$ |
| $5x$ | $25x^2$ | $\frac{p}{2}x$ |
| $+4$ | $\frac{p}{2}x$ | $+16$ |

$$\frac{p}{2}x = 20x$$

$$px = 40x$$

$$p = 40$$

Check: $25x^2 + 40x + 16$

Factorise?

$$25x^2 + 40x + 16$$

$$(5x + 4)(5x + 4) \quad \checkmark$$

$\underbrace{\hspace{10em}}_{20x}$

Example 4

Divide $(2x^3 - 11x + 6)$ by $(2x^2 + 4x - 3)$.

DMSA

$$\begin{array}{r}
 x-2 \\
 \hline
 2x^2+4x-3 \overline{) 2x^3+0x^2-11x+6} \\
 \underline{+ 2x^3+4x^2-3x} \\
 -4x^2-8x+6 \\
 \underline{+ 4x^2+8x+6} \\
 0
 \end{array}$$

2. State the degree of each of the following polynomial expressions.

(i) $-3x^2 + 5x - 1$

2

(ii) $4x^3 - 4x^2 + 9x + 3$

3

(iii) $7 + 3x - 3x^3 - 6x^4$

4

Degree = highest power of x