# POLYNOMIALS

**1** For the polynomial $P(x) = 3x^4 + 2x^3 + 7$, which statement is correct?

**A** degree = 3 **B** leading term = 3 **C** leading coefficient = 3 **D** constant term = 3

**2** Express the polynomial $P(x) = x^2 - x^3 + 6x$ in standard form. Then write:

**(a)** its degree **(b)** the constant term **(c)** the coefficient of $x^2$ **(d)** the leading term

**(e)** the greatest number of real zeros possible. **(f)** Hence solve the equation $P(x) = 0$.

**3** Write the following polynomials in standard form and then state:

**(i)** the degree **(ii)** the constant term **(iii)** the coefficient of $x^2$

**(iv)** whether or not it is monic **(v)** the greatest number of real zeros possible.

**(a)** $x^2 + 5x^3 + 7 - 6x$ **(b)** $27 - x^3$ **(c)** $ax^3 + bx + cx^2 - d$

**4** State whether each expression is a polynomial or not. If it is not a polynomial, explain why.

**(a)** $x^2 - 6x + 3$ **(b)** $x + 4$ **(c)** $\sqrt{3}x - 4$ **(d)** $x^9 + 1$ **(e)** $4 - \frac{1}{x}$

**(f)** $\frac{6x+2}{3}$ **(g)** $x^2 + 3x^{\frac{1}{2}} - 4x^{-1}$ **(h)** $\frac{3x+2}{3x-1}$ **(i)** $2^x + 3x - 5$

**5** If $A(x) = x^2 - 5x + 1$ and $B(x) = 3x^4 - 2x^2 + 5x + 3$, then $B(x) - A(x) = \ldots$

**A** $-3x^4 + 3x^2 - 10x - 2$ **B** $3x^4 - 3x^2 + 2$ **C** $3x^4 - 3x^2 - 10x + 2$ **D** $3x^4 - 3x^2 + 10x + 2$

**6** If $A(x) = 3x^2 - 2x + 1$, $B(x) = 5x - 2$, $C(x) = 2x^4 - 5x^2 + 3x + 4$ and $D(x) = 2x^5 - 4x^2 - 3$, simplify:

**(a)** $A(x) + C(x)$ **(b)** $B(x) \times D(x)$ **(c)** $D(x) - C(x)$

**(d)** $A(x) \times B(x)$ **(e)** $A(x) - 3C(x) + 2B(x)$

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**7** If $E(x) = x^2 - 3$, $F(x) = 3x + 2$, $G(x) = x^2 + 2x + 1$ and $H(x) = x^2 - 3x + 2$, find the polynomial for:

**(a)** $E(x) \times F(x)$ **(b)** $F(x) \times G(x)$ **(c)** $3G(x) - 4H(x)$

**(d)** $(x - 3)G(x)$ **(e)** $[F(x)]^2$ **(f)** $E(x) \times G(x) + F(x) \times H(x)$