

Section 1: Polynomial functions and graphs**Exercise level 1**

- Given that $f(x) = x^3 + 2x^2 - 5x + 4$ and $g(x) = x^3 - 3x^2 + 1$, find
 - $f(x) + g(x)$
 - $f(x) - g(x)$
- Given that $p(x) = 2x^3 - 5x^2 + 3x - 2$ and $q(x) = x^3 - 2x^2 + 1$, find
 - $q(x) - p(x)$
 - $2p(x) + 3q(x)$
- Given that $f(x) = x^3 + 5x^2 - 3$ and $g(x) = 3x^4 - 2x^3 + x$, find
 - $g(x) - 3f(x)$
 - $(2x + 1)f(x)$
- Expand the brackets and simplify the following as far as possible:
 - $(x - 2)(2x^2 - 3x + 1)$
 - $(3x - 2)(x^3 - 2x + 4)$
 - $(2x + 1)(x^3 + 2x^2 - 3x - 5)$
 - $(x + 3)(2x - 1)(x - 4)$
- Given $p(x) = 2x^2 + x - 1$ and $q(x) = 2x - 1$ find
 - $p(x) + q(x)$
 - $p(x)q(x)$
- Sketch the following graphs:
 - $y = (x + 1)(x - 3)(x + 4)$
 - $y = (x + 2)^2(2x - 1)$