Section 1: Polynomial functions and graphs

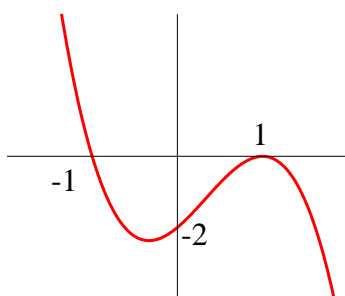### Section test

Questions 1 – 5 are about the polynomials

$$f(x) = x^4 - 2x^3 + 2x - 1$$
$$g(x) = 3x^3 + 4x^2 - 2x + 5$$

1. Find f(x) + g(x).

2. Find f(x) – g(x).

3. Find $(x-2)f(x)$.

4. Find $(2x+1)g(x)$.

5. What is the degree of the polynomial obtained by multiplying f(x) by g(x)?

6. When the expression $(x^2 - x + 1)(2x^2 + 3x - 2)$ is multiplied out and simplified, find
    (i) the coefficient of x^3 (ii) the coefficient of x^2 (iii) the coefficient of x.

7. When the expression $(x-3)(x+2)(2x-3)$ is multiplied out and simplified, find
    (i) the coefficient of x^2 (ii) the coefficient of x.

8. The graph of $y = (x-2)(2x-3)(x+1)$ cuts the coordinate axes at which of the points below?
    (2, 0)   (-2, 0)   (1.5, 0)   (-1.5, 0)   (3, 0)
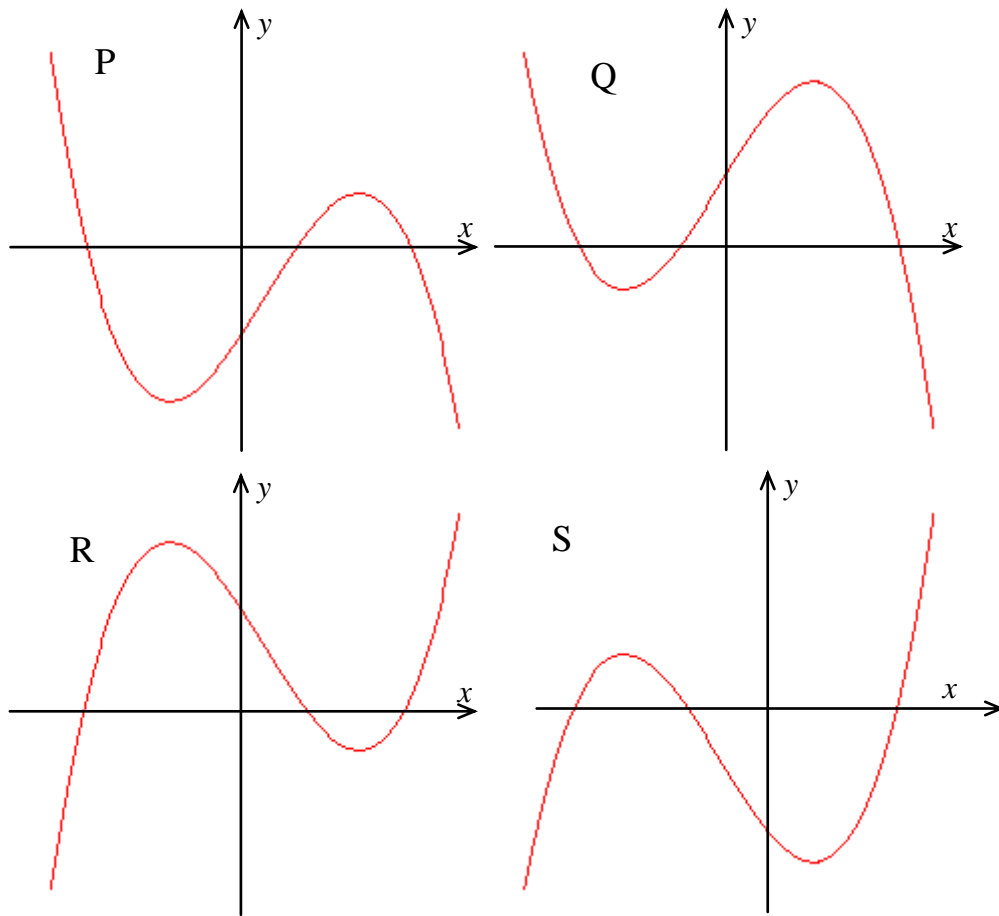   (1, 0)   (-1, 0)   (0, 6)   (0, -6)

9. The equation of the graph below could be

    (a) $y = (x+1)(x-1)^2$ (b) $y = -2(x+1)(x-1)^2$
    (c) $y = (x-1)(x+1)^2$ (d) $y = 2(x+1)(x-1)$

10. Which of the graphs below represents $y = (x - a)(x - b)(x + c)$, where a, b and c are all positive constants?

(a) P

(b) Q

(c) R

(d) S