Section 2: Dividing and factorising polynomials

Exercise level 2

1. Divide $6x^4 - 4x^3 + 3x^2 + 4x - 4$ by $3x - 2$.

2. (i) Show that $x - 2$ is a factor of $f(x) = 2x^3 + x^2 - x - 18$.
   (ii) Factorise the equation $2x^3 + x^2 - x - 18 = 0$ as far as possible, and show that it only has one root.

3. $x - 2$ and $x + 1$ are both factors of $3x^3 + ax^2 + bx + 10$.
   Find the values of *a* and *b*.
   Hence solve the equation $3x^3 + ax^2 + bx + 10 = 0$.

4. (i) Show that $x - 2$ is a factor of the polynomial $f(x) = x^3 - x^2 - x - 2$
   (ii) Hence factorise f(*x*) as far as possible.
   (iii) What can you say about the graph of $y = f(x)$?

5. Solve the equation $3x^3 - 2x^2 - 11x + 10 = 0$.

6. Solve the equation $2x^3 + 5x^2 - 14x - 8 = 0$.

7. Solve the equation $4x^3 + 12x^2 - 7x - 30 = 0$.