AQA Level 2 Further mathematics Further algebra

Section 2: Further equations

Exercise

1. Solve the following simultaneous equations:
   (i) $2x + 5y = 11$
      $2x - y = 5$

   (ii) $x + 2y = 6$
       $4x + 3y = 4$

   (iii) $3a - 2b = 4$
        $5a + 4b = 3$

   (iv) $2p - 5q = 5$
       $3p - 2q = -9$

   (v) $5x + 3y = 9$
      $y = 3x - 4$

   (vi) $3a + 2b = 1$
       $9a - 4b = 4$

2. Solve the following simultaneous equations.
   (i) $7x^2 + y^2 = 64$
      $x + y = 4$

   (ii) $3x^2 - 2y^2 = -5$
       $y - x = 1$

   (iii) $p^2 + pq = 2$
        $q - p = 3$

   (iv) $8a^2 - b^2 = 2$
       $2a + b = 1$

3. (i) Show that $x + 1$ is a factor of $x^3 - 4x^2 + x + 6$.
   (ii) Hence factorise $x^3 - 4x^2 + x + 6$. completely.

4. $x - 2$ is a factor of the polynomial $x^3 + ax^2 - 4x + 12$.
   (i) Find the value of a.
   (ii) Factorise the polynomial completely.

5. Solve the equations
   (i) $x^3 - 2x^2 - 11x + 12 = 0$
   (ii) $x^3 + 4x^2 - 3x - 18 = 0$
   (iii) $x^3 - 19x - 30 = 0$

6. Bob factorises $x^3 - 4x^2 - 7x + 10$ and gets $(x - 1)(x - 2)(x + 5)$.
   Explain how you know that Bob is wrong.

7. A rectangle with length x cm and width y cm has a square
   3 cm by 3 cm removed from a corner to leave an L shape.
   The area of the L shape is 15 cm^2.
   The perimeter of the L shape is 20 cm.

   Find the values of x and y.