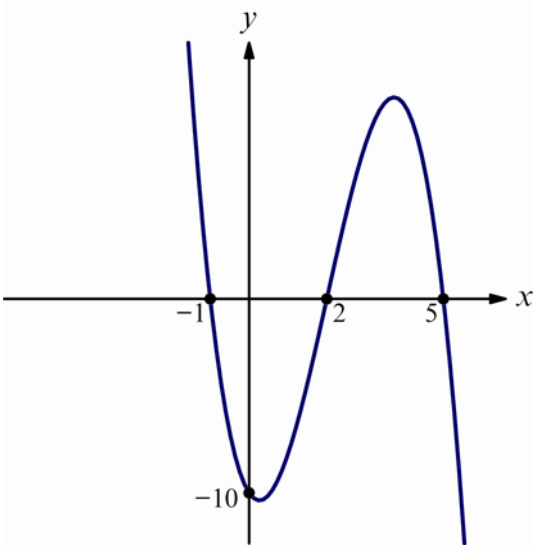
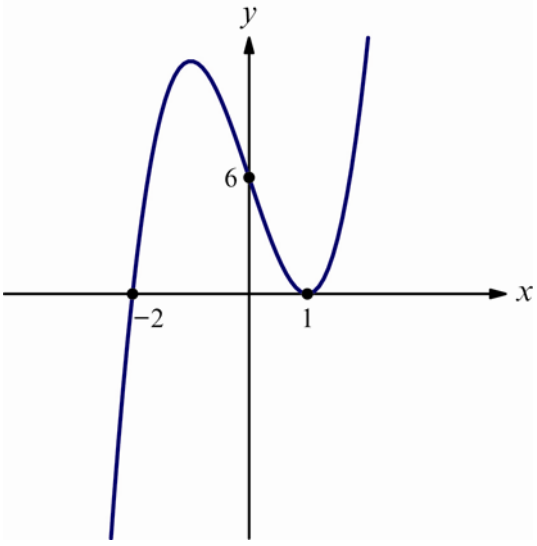
Self-assessment: 3 Polynomials

1. The graphs below all have polynomial equations. Find the equation of the lowest possible order polynomial for each graph.

(a)



(b)



[6 marks]

2. The polynomial $3x^3 - ax^2 + 4x + b$ has a factor$(x - 2)$ and gives remainder 3 when divided by $(x + 1)$. Find the values of a and b.

(accessible to students on the path to grade 3 or 4) [4 marks]

3. The polynomial equation $a_3x^3 + a_2x^2 + 5x + 12 = 0$ has three real roots whose sum is 5 and whose product is −16. Find the values of $a_2$and a_3.

(accessible to students on the path to grade 3 or 4) [4 marks]

4. Find the value of k for which the curve with equation $y = kx^2 - 3x + 6$ is tangent to the x-axis.

(accessible to students on the path to grade 5 or 6) [3 marks]

5. Do not use a calculator to answer this question.

Show that $(x + 2)$ is a factor of $f(x) = 2x^3 + 3x^2 - 12x - 20$. Factorise $f(x)$ completely.

(accessible to students on the path to grade 5 or 6) [6 marks]

6. Show that the graph of $y = x^2 - (m + 3)x + (m + 1)$ crosses the x-axis for all values of m.

(accessible to students on the path to grade 7) [5 marks]