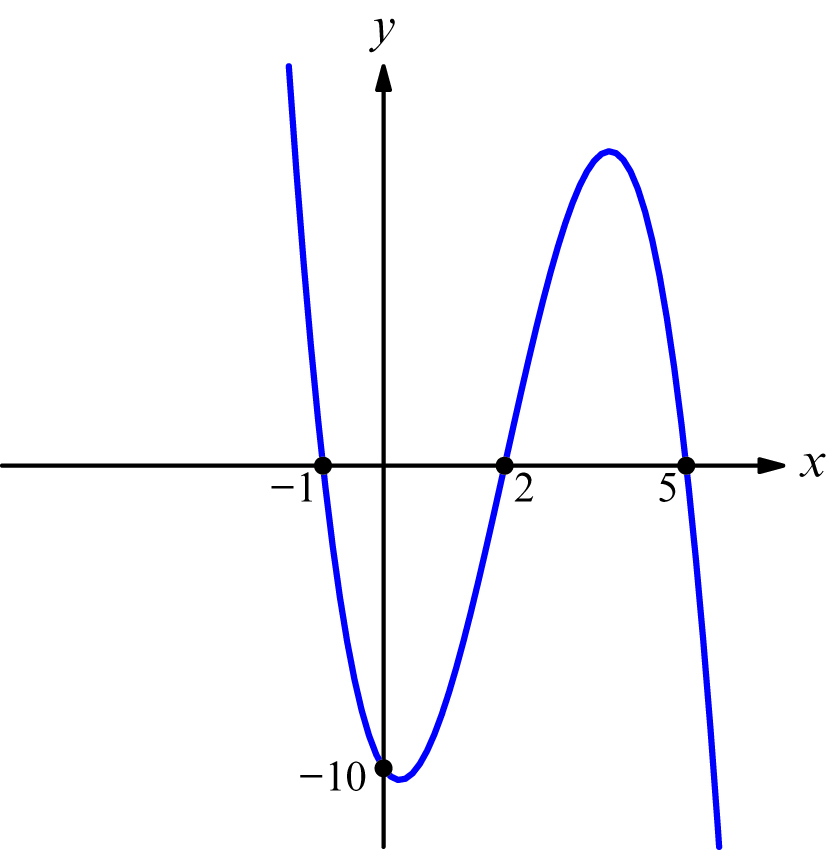
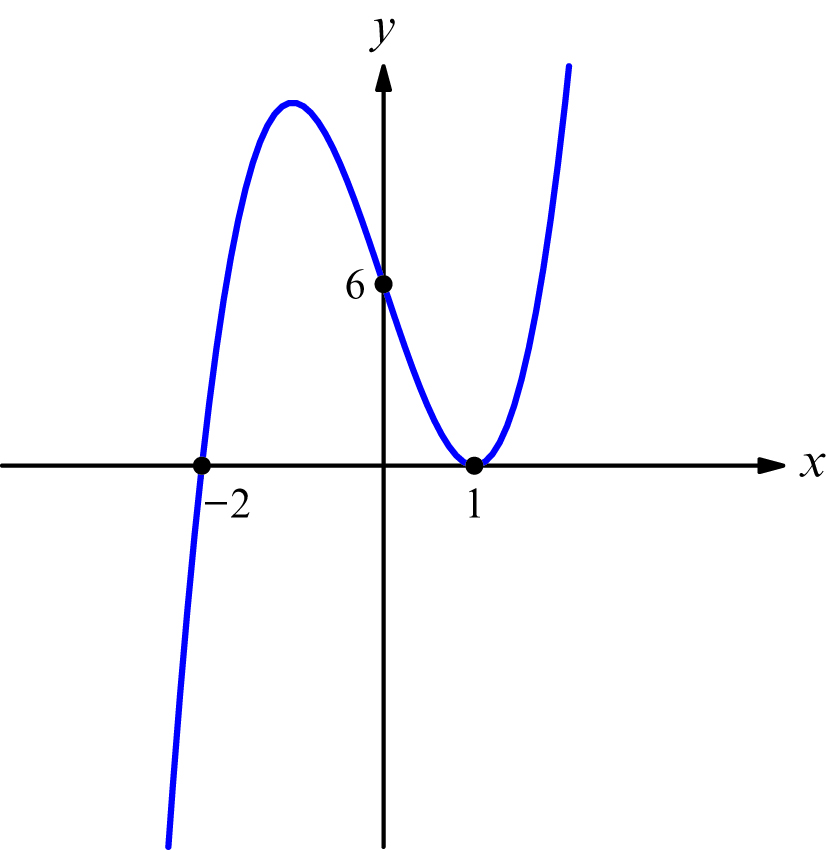
**Self-assessment: 3 Polynomials**

**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 3*x*3 – a*x*2 + 4*x* + *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*3*x*3 + *a*2*x*2 + 5*x* + 12 = 0 has three real roots whose sum is 5 and whose product is −16. Find the values of *a*2and *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 – 3*x* + 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*) = 2*x*3 + 3*x*2 – 12*x* – 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]*