1. Find the equation of each quadratic graph shown below.

(a)

(b)
2. (a) Write \(2x^2 - 12x + 25\) in the form \(a(x - h)^2 + k\).

(b) Hence find the minimum value of \(2x^2 - 12x + 25\).

(accessible to students on the path to grade 3 or 4) [5 marks]

3. A ball is thrown from the top of a 60 m tall building. The distance travelled by the ball in the first \(t\) seconds is given by \(d = 2t + 4.9t^2\). After how many seconds is the ball 12 m above ground?

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

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

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

(b) For this value of \(k\), find the equation of the axis of symmetry of the curve.

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

5. A piece of wire of length 30 cm is cut into two pieces, which are used to form a square of side \(a\) cm and a rectangle with sides 6 cm and \(w\) cm.

(a) Given that the square and the rectangle have equal areas, show that \(a^2 + 12a - 54 = 0\).

(b) Hence find the exact values of \(a\) and \(w\) for which the square and the rectangle have equal areas.

(accessible to students on the path to grade 5 or 6) [10 marks]