Section 1: Quadratic graphs and equations

Exercise level 1

1. Factorise these quadratic expressions.

(i)	x^2+5x+6	(ii)	x^2+x-12	(iii)	x^2-9
(iv)	x^2-6x+8	(v)	$2x^2+3x+1$	(vi)	$3x^2+x-2$
(vii)	$4x^2-8x+3$	(viii)	$4x^2-25$	(ix)	$6x^2-x-12$

2. Factorise:

(i)	x^2-4x	(ii)	$x^2-17x-60$
(iii)	$x^2+4(x+1)$	(iv)	$3x^2-11x+6$

3. Solve these quadratic equations by factorising.

(i)	$x^2+4x+3=0$	(ii)	$x^2+5x-6=0$
(iii)	$x^2-6x+8=0$	(iv)	$x^2-7x-18=0$
(v)	$2x^2+5x+3=0$	(vi)	$2x^2+x-6=0$

4. Write down the equation of the line of symmetry and the coordinates of the vertex of each of the following quadratic graphs:

(i)	$y=(x-4)^2+1$	(ii)	$y=(x+2)^2-3$
(iii)	$y=(2x-1)^2-5$	(iv)	$y=3-(x+1)^2$

5. A quadratic graph has minimum point (-1, 2). Find an equation for the graph.

6. A quadratic graph has maximum point (2, 5). Find an equation for the graph.

7. Write each of the following quadratic functions in completed square form:

(i)	x^2+2x-3	(ii)	x^2-6x+1
(iii)	x^2+x+1	(iv)	$-x^2+5x$
(v)	$2x^2+4x+3$	(vi)	$3x^2+8x-2$

8. Using your answers for each of the quadratic functions in question 7, write down the coordinates of the minimum or maximum point (the vertex) of the graph.

(i)	$y=x^2+2x-3$	(ii)	$y=x^2-6x+1$
(iii)	$y=x^2+x+1$	(iv)	$y=-x^2+5x$
(v)	$y=2x^2+4x+3$	(vi)	$y=3x^2+8x-2$