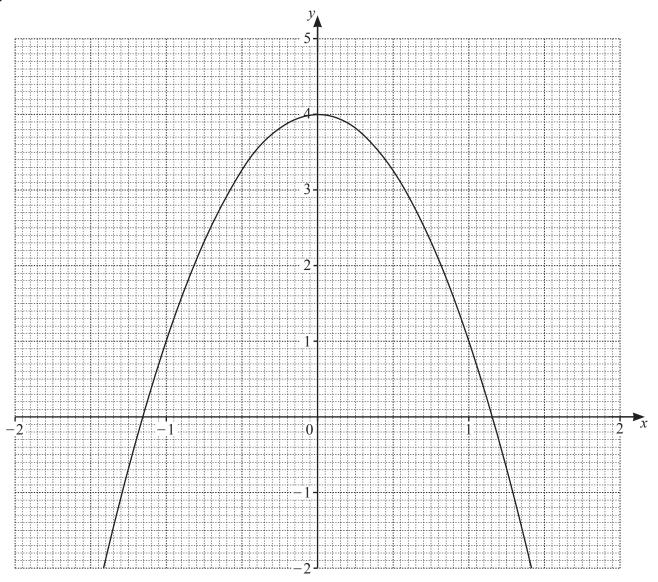**6**

(a) The grid shows the graph of $y = a + bx^2$.

The graph passes through the points with coordinates (0, 4) and (1, 1).

(i) Find the value of a and the value of b.

$a =$ ....

$b =$ .... [2]

(ii) Write down the equation of the tangent to the graph at $(0, 4)$.

.... [1]

(iii) The equation of the tangent to the graph at $x = -1$ is $y = 6x + 7$.

Find the equation of the tangent to the graph at $x = 1$.

.... [2]

(b) The table shows some values for $y = 1 + \dfrac{5}{3-x}$ for $-2 \leqslant x \leqslant 1.5$.

x	-2	-1.5	-1	-0.5	0	0.5	1	1.5
y	2	2.11		2.43		3		4.33

(i) Complete the table. [3]

(ii) On the grid, draw the graph of $y = 1 + \dfrac{5}{3-x}$ for $-2 \leqslant x \leqslant 1.5$. [4]

(c) **(i)** Write down the values of x where the two graphs intersect.

$x = $ .... or $x = $ .... [2]

(ii) The answers to **part(c)(i)** are two solutions of a cubic equation in terms of x.

Find this equation in the form $ax^3 + bx^2 + cx + d = 0$, where a, b, c and d are integers.

.... [4]