Exit Note: Quadratic functions

1a. Factorise the expression $x^2 + x - 12$.

[2 marks]

1b. A function is defined as $f(x) = x^3 - 2$ for $x \in \mathbb{Z}, -3 \leqslant x \leqslant 3$.

(i) List the elements of the domain of $f(x)$.

(ii) Write down the range of $f(x)$.

[2 marks]

2a. Consider the quadratic function $y = f(x)$, where $f(x) = 6 - 4x + ax^2$.

It is given that $f(2) = 6$. Find the value of a.

[2 marks]

2b. Find the equation of the axis of symmetry of the graph of $y = f(x)$.

[2 marks]

2c. Write down the range of this quadratic function.

[2 marks]