BECA / Dr. Huson / IB Mathematics Name:
21 November 2017

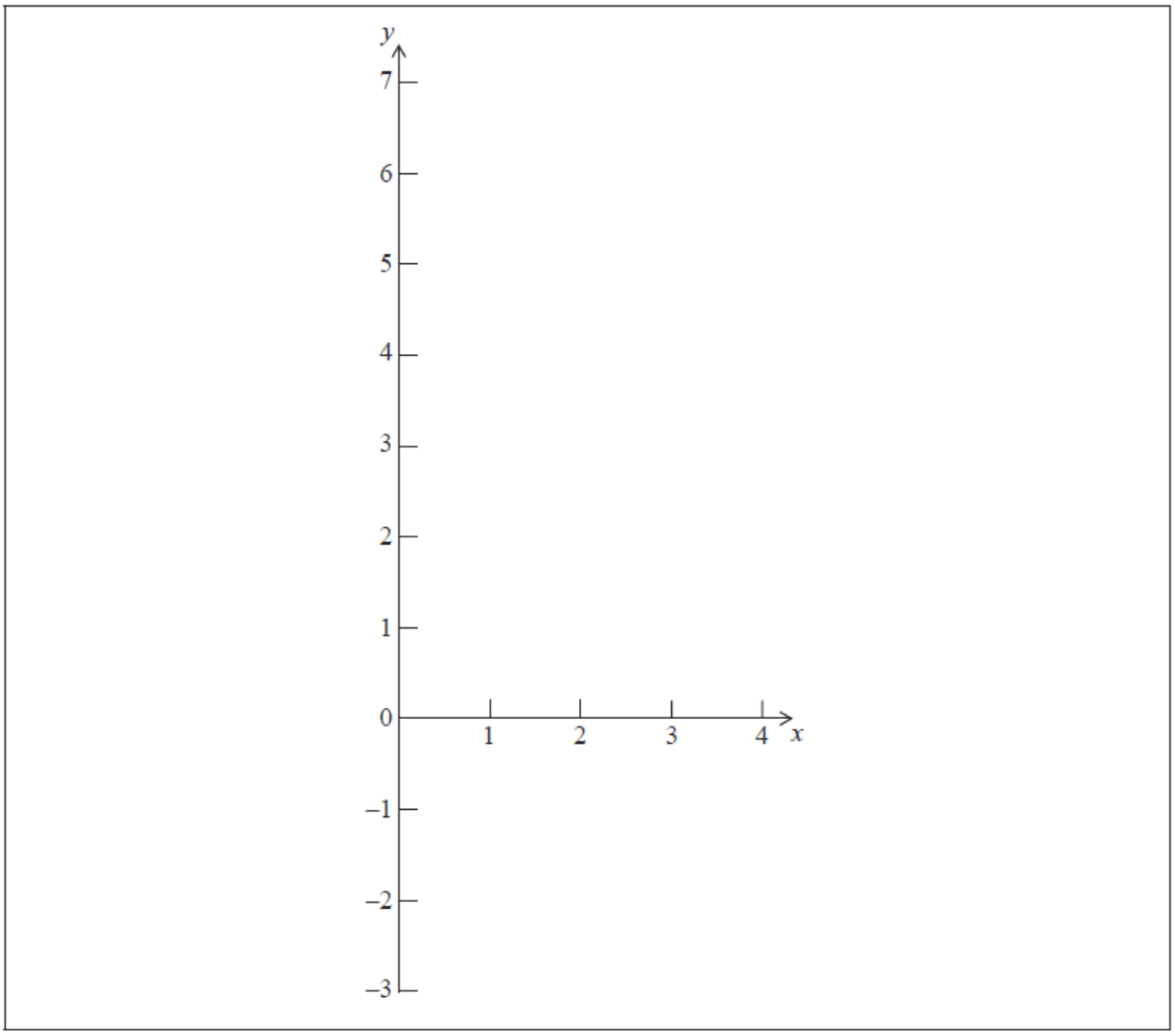
Homework: Quadratic functions

1a. $y = f(x)$ is a quadratic function. The graph of $f(x)$ intersects the y-axis at the point A(0, −3) and the x-axis at the point B(3, 0). The vertex of the graph is at the point C(2, 1).

Write down the equation of the axis of symmetry. *[2 marks]*

1b. Sketch the graph of $y = f(x)$ on the axes below for $0 \le x \le 4$. Mark clearly on the sketch the points A , B , and C.

[3 marks]



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2a. Factorise the expression $x^2 - 3x - 10$.

[2 marks]

2b. A function is defined as $f(x) = 1 + x^3$ 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]

3a. Consider the quadratic function $y = f(x)$, where $f(x) = 5 - x + ax^2$.

It is given that $f(2) = -5$. Find the value of a.

[2 marks]

3b. Find the equation of the axis of symmetry of the graph of $y = f(x)$.

[2 marks]

3c. Write down the range of this quadratic function.

[2 marks]