5.8 Do Now: Graphing and interpreting quadratic functions

1. Given $f(x) = -(x-3)^2 + 16$

   (a) Write down the vertex of the function as an ordered pair.

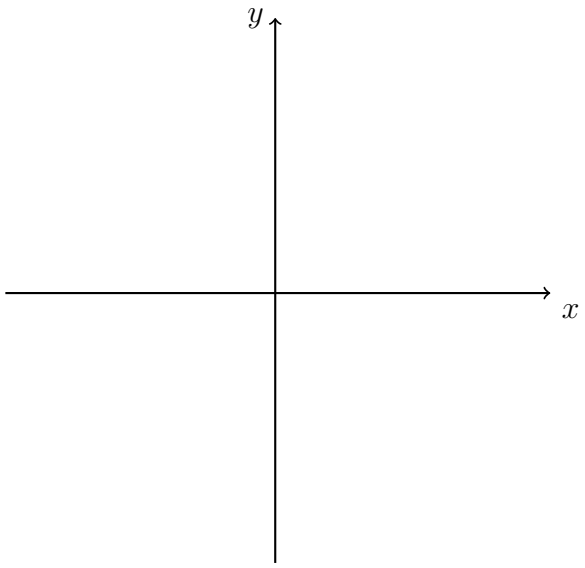
   (b) Write down the equation of the axis of symmetry.

   (c) Expand $f(x)$ from vertex form to standard form, $ax^2 + bx + c$ where $a, b, c \epsilon \mathbb{R}$.

   (d) Write down the value of $f(0)$. Explain what this represents on the graph.

   (e) Hence factor the function. Write down the roots.

   (f) Sketch the function, labeling the intercepts with values and the vertex as an ordered pair. Show the axis of symmetry as a dotted line and label it with its equation.



   (g) Write down the domain and range of the function.

Graphing quadratics

Answer on lined paper. Graph the function on the grid shown below.

2. Given the function $f(x) = -x^2 - x + 6$.
   (a) Write down the y-intercept.
   (b) State whether the parabola opens upward or downward. Explain how you know this from the function expressed in standard form.
   (c) Express the function in factored form. Hence state the solutions to $f(x) = 0$.
   (d) Show that the axis of symmetry of the parabola is $x = -\frac{1}{2}$.
   (e) Hence state the vertex as an ordered pair.
   (f) Graph the function. Mark the vertex as an ordered pair and label each intercept with its value. Plot the axis of symmetry as a dotted line and label it with its equation.
   (g) Write down the domain and range of the function.