Axis of symmetry

The equation of the axis of symmetry is x = C.

Axis of symmetry is the vertical line splitting the graph into half.

Quadratic form: $y = ax^2 + bx + c$

Axis of symmetry is $x = \dfrac{-b}{2a}$

1. The x-intercepts of a quadratic function are 1 and 9.
   Find the equation of axis of symmetry.

2. The x-intercepts of a quadratic function are −2 and 6.
   Find the equation of axis of symmetry.

3. The vertex of a quadratic function is (4, 10).
   Find the equation of axis of symmetry.

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4. The vertex of a quadratic function is (−1, 7).
   Find the equation of axis of symmetry.

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5. Find the equation of axis of symmetry for the quadratic function $f(x) = 2x^2 + 4x - 1$.

6. Find the equation of axis of symmetry for the quadratic function $f(x) = -4x^2 + 2x + 10$.

Completing the square

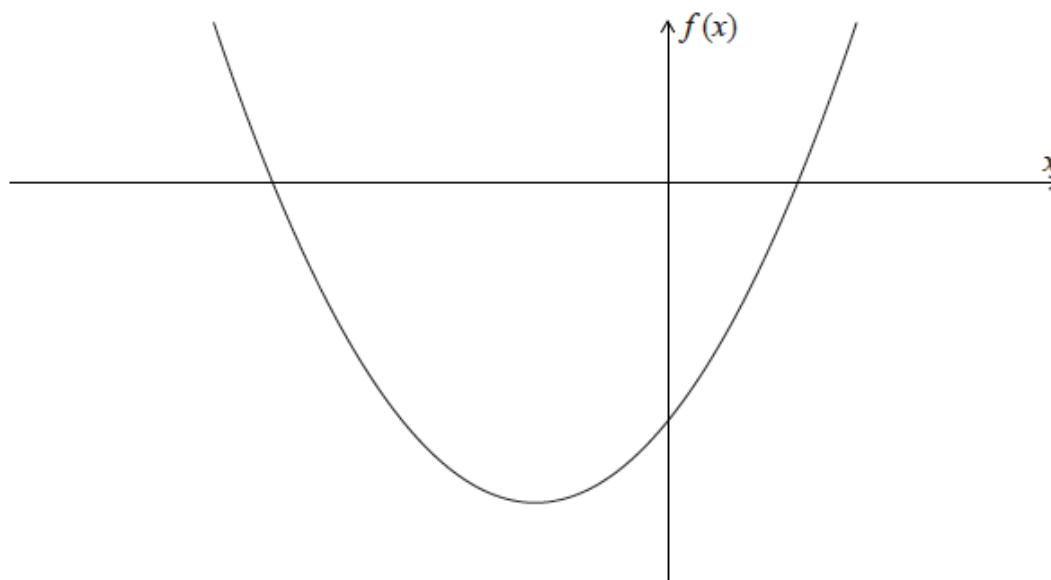Quadratic form to vertex form $y = (x - h)^2 + k$
(h, k) is the vertex.

Write the following quadratic forms in the form of $y = (x - h)^2 + k$ by completing the square and hence find the coordinates of the vertex.

1. $x^2 + 2x + 10$

2. $x^2 - 4x - 2$

3. $3x^2 + 6x - 4$

4. $2x^2 - 8x + 3$

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Exercise

1. 🚫 The diagram below shows part of the graph of
   $f(x) = (x - 1)(x + 3)$.

(a) Write down the x-intercepts of the graph of f.
(b) Find the coordinates of the vertex of the graph of f.

2. Let $f(x) = a(x - h)^2 + k$. The vertex of the graph of f is at (2, 3) and the graph passes through (1,7).

(a) Write down the value of h and of k.
(b) Find the value of a.