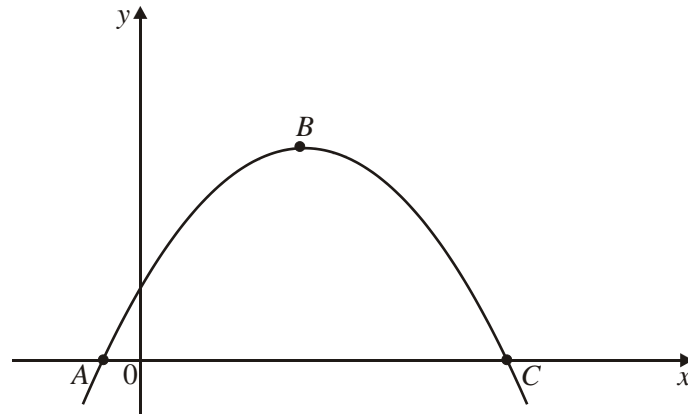


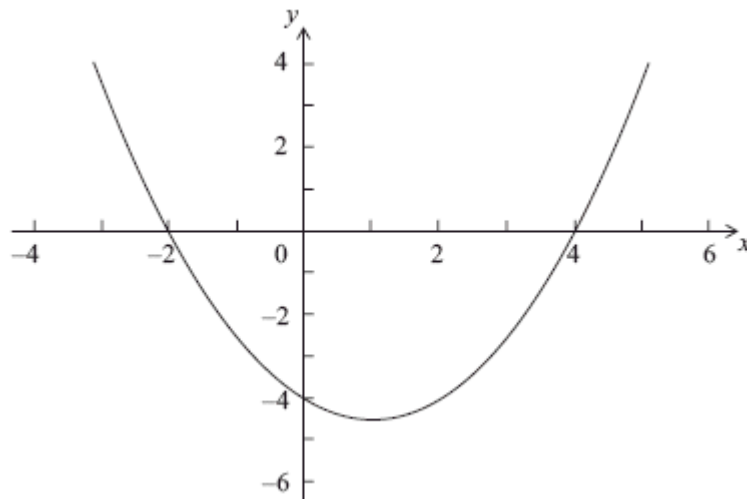
1. The diagram shows the parabola $y = (7 - x)(1 + x)$. The points A and C are the x -intercepts and the point B is the maximum point.



Find the coordinates of A , B and C .

(Total 4 marks)

2. Let $f(x) = p(x - q)(x - r)$. Part of the graph of f is shown below.



The graph passes through the points $(-2, 0)$, $(0, -4)$ and $(4, 0)$.

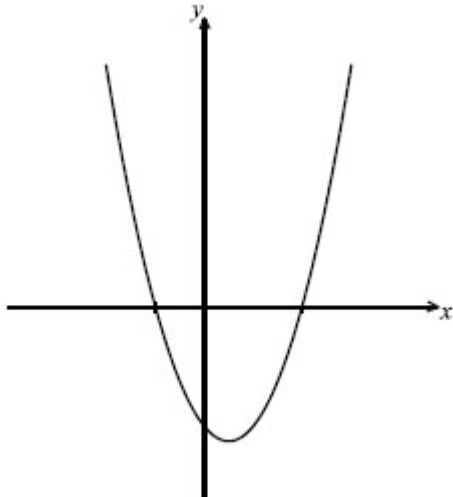
- (a) Write down the value of q and of r . (2)
- (b) Write down the **equation** of the axis of symmetry. (1)
- (c) Find the value of p . (3)

(Total 6 marks)

3. The equation $x^2 - 2kx + 1 = 0$ has two distinct real roots. Find the set of all possible values of k .

(Total 6 marks)

4. The following diagram shows part of the graph of f , where $f(x) = x^2 - x - 2$.



- (a) Find both x -intercepts.

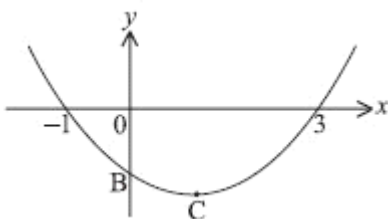
(4)

- (b) Find the x -coordinate of the vertex.

(2)

(Total 6 marks)

5. Part of the graph of $f(x) = (x - p)(x - q)$ is shown below.



The vertex is at C. The graph crosses the y -axis at B.

- (a) Write down the value of p and of q .

- (b) Find the coordinates of C.

- (c) Write down the y -coordinate of B.

(Total 6 marks)

6. Consider $f(x) = 2kx^2 - 4kx + 1$, for $k \neq 0$. The equation $f(x) = 0$ has two equal roots.

(a) Find the value of k .

(5)

(b) The line $y = p$ intersects the graph of f . Find all possible values of p .

(2)

(Total 7 marks)

7. Let $f(x) = a(x - 4)^2 + 8$.

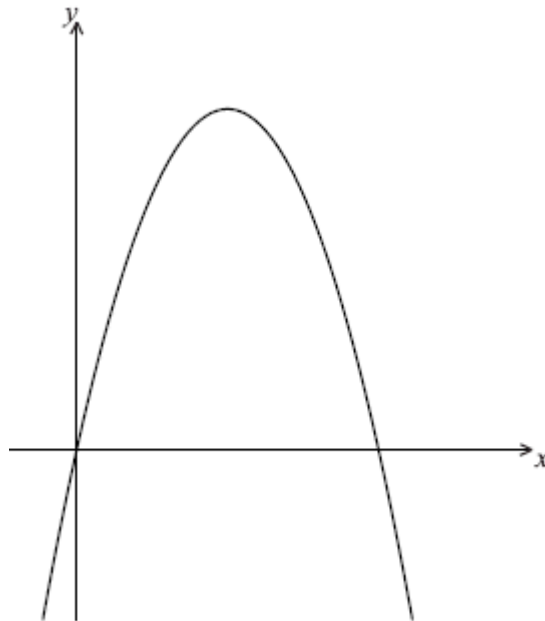
(a) Write down the coordinates of the vertex of the curve of f .

(b) Given that $f(7) = -10$, find the value of a .

(c) Hence find the y -intercept of the curve of f .

(Total 6 marks)

8. Let $f(x) = 8x - 2x^2$. Part of the graph of f is shown below.



(a) Find the x -intercepts of the graph.

(4)

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

(ii) Find the y -coordinate of the vertex.

(3)

(Total 7 marks)

9. Let $f(x) = 2x^2 + 4x - 6$.

(a) Express $f(x)$ in the form $f(x) = 2(x - h)^2 + k$. (3)

(b) Write down the equation of the axis of symmetry of the graph of f . (1)

(c) Express $f(x)$ in the form $f(x) = 2(x - p)(x - q)$. (2)
(Total 6 marks)

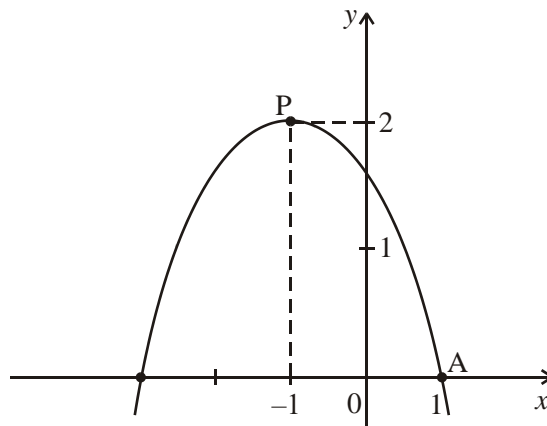
10. Consider the function $f(x) = 2x^2 - 8x + 5$.

(a) Express $f(x)$ in the form $a(x - p)^2 + q$, where $a, p, q \in \mathbb{Z}$.

(b) Find the minimum value of $f(x)$.

(Total 6 marks)

11. The diagram shows part of the graph of $y = a(x - h)^2 + k$. The graph has its vertex at P, and passes through the point A with coordinates (1, 0).



(a) Write down the value of

(i) h ;

(ii) k .

(b) Calculate the value of a .

(Total 6 marks)