SQA Past paper questions

2024 - Paper 1 - Question 12

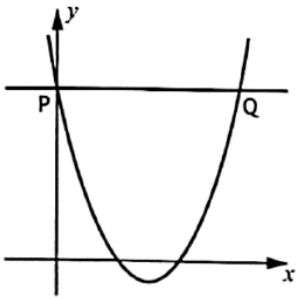
(a) Express x^2-6x+8 in the form $(x-a)^2+b$. 2

(b) Hence, or otherwise, state the coordinates of the turning point of the graph of $y=x^2-6x+8$. 1

The diagram shows the graph of $y=x^2-6x+8$.

A line PQ has been drawn parallel to the x-axis, where:

- P lies on the y-axis
- P and Q lie on the graph of $y=x^2-6x+8$.

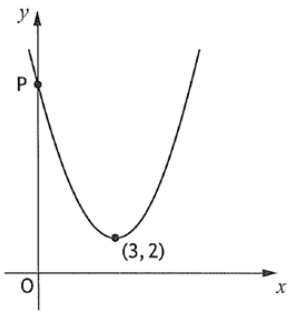


(c) Find the coordinates of Q. 2

Click here for video solution.

2023 - Paper 1 - Question 4

The graph below shows part of a parabola of the form $y=(x+a)^2+b$.



(a) (i) State the value of a. 1

(ii) State the value of b. 1

(b) P is the point $(0, c)$.
Find the value of c. 1

Click here for video solution.

2022 - Paper 1 - Question 14

Sketch the graph of $y=(x+1)(x-3)$ using the axes provided below.

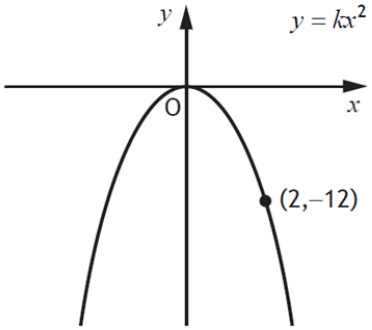
On your sketch, show clearly the points of intersection with the x-axis and the y-axis, and the coordinates of the turning point.

3

Click here for video solution.

2021 - Paper 1 - Question 6

The diagram below shows part of the graph of $y = kx^2$.



Find the value of k. **2**

Click here for video solution.

2021 - Paper 1 - Question 17

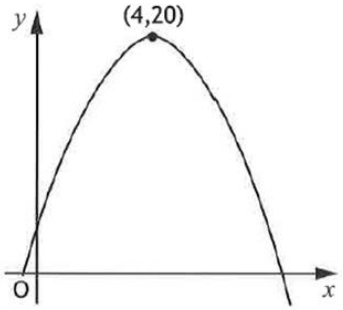
Sketch the graph of $y = 2(x-1)^2 + 4$.

On your sketch, show clearly the coordinates of the turning point and the point of intersection with the y-axis. **3**

Click here for video solution.

2019 - Paper 1 - Question 9

The graph shows a parabola.



(a) Write down the equation of the axis of symmetry of the graph. **1**

The equation of the parabola is of the form $y = b-(x+a)^2$.

(b) State the values of

(i) a **1**

(ii) b. **1**

Click here for video solution.

2018 - Paper 1 - Question 16

Sketch the graph of $y=(x-6)(x+4)$.

On your sketch, show clearly the points of intersection with the x-axis and the y-axis, and the coordinates of the turning point. 3

Click here for video solution.

2017 - Paper 1 - Question 14

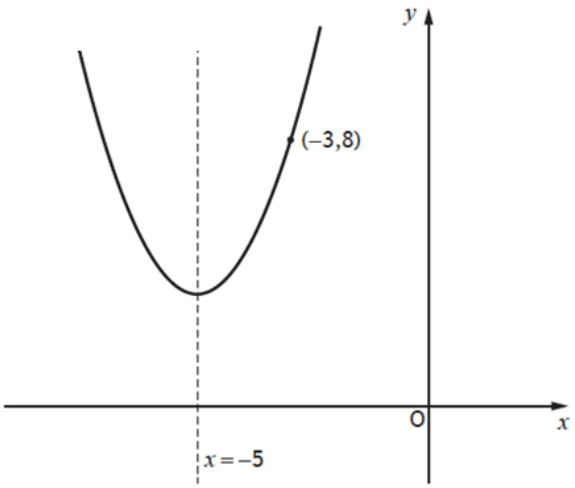
The graph below shows a parabola with equation of the form $y=(x+a)^2+b$.

The equation of the axis of symmetry of the parabola is $x=-5$.

(a) State the value of a. 1

The point $(-3,8)$ lies on the parabola.

(b) Calculate the value of b. 2



Click here for video solution.

2016 - Paper 1 - Question 10

Sketch the graph of $y=(x-3)^2+1$.

On your sketch, show clearly the coordinates of the turning point and the point of intersection with the y–axis. 3

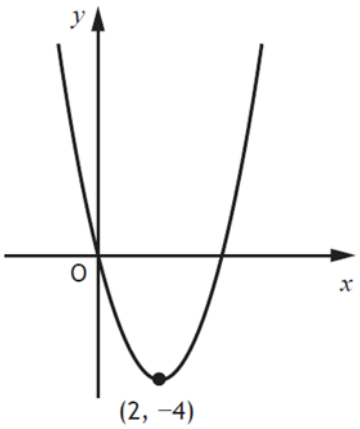
Click here for video solution.

2015 - Paper 1 - Question 7

The graph below shows part of the parabola with equation of the form

$$y = (x + a)^2 + b.$$

The minimum turning point (2, −4) is shown in the diagram.



(a) State the values of

(i) a 1

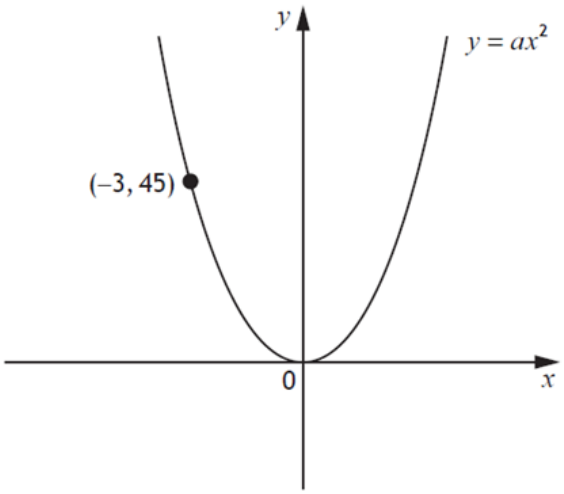
(ii) b. 1

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

Click here for video solution.

2014 - Paper 1 - Question 7

The diagram below shows part of the graph of $y = ax^2$

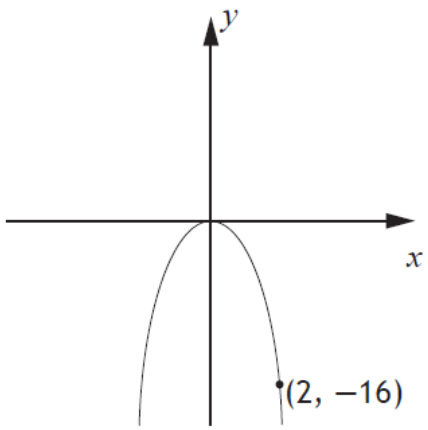


Find the value of a. 2

Click here for video solution.

Specimen - Paper 1 - Question 4

The graph with equation $y = kx^2$ is shown below.



The point (2, −16) lies on the graph.

Determine the value of k. **2**

Click here for video solution.

Specimen - Paper 1 - Question 9

A parabola has equation $y = x^2 - 8x + 19$.

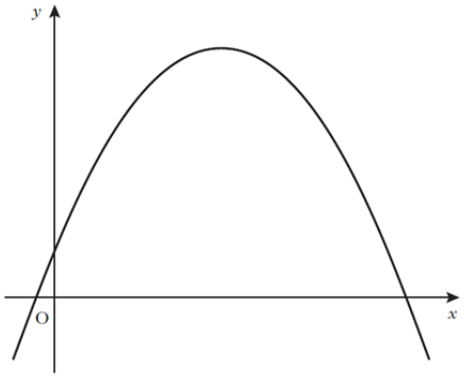
(a) Write the equation in the form $y = (x - p)^2 + q$. **2**

(b) Sketch the graph of $y = x^2 - 8x + 19$, showing the coordinates of the turning point and the point of intersection with the y-axis. **3**

Click here for video solution.

2013 - Paper 1 – Question 9

The diagram below shows part of the graph of $y = 20 - (x - 4)^2$.



(*a*) State the coordinates of the maximum turning point. **2**

(*b*) State the equation of the axis of symmetry. **1**

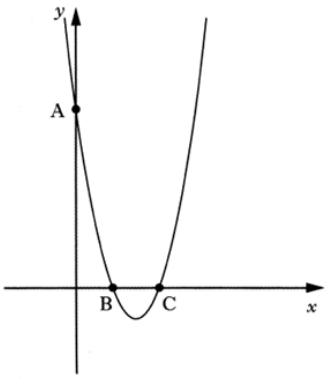
Click here for video solution.

2012 - Paper 1 – Question 6

The equation $x^2 - 6x + 8 = 0$ can also be written as $(x - 2)(x - 4) = 0$.

(*a*) Write down the roots of the equation $x^2 - 6x + 8 = 0$. **1**

Part of the graph of $y = x^2 - 6x + 8$ is shown below.



(*b*) State the coordinates of the points A, B and C. **3**

(*c*) What is the equation of the axis of symmetry of this graph? **1**

Click here for video solution.

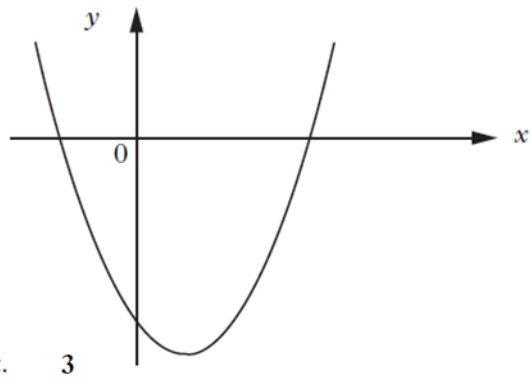
2011 - Paper 1 – Question 9

(*a*) Factorise $x^2 - 4x - 21$. **2**

(*b*) Hence write down the roots of the equation

$$x^2 - 4x - 21 = 0.$$ **1**

(*c*) The graph of $y = x^2 - 4x - 21$ is shown in the diagram.

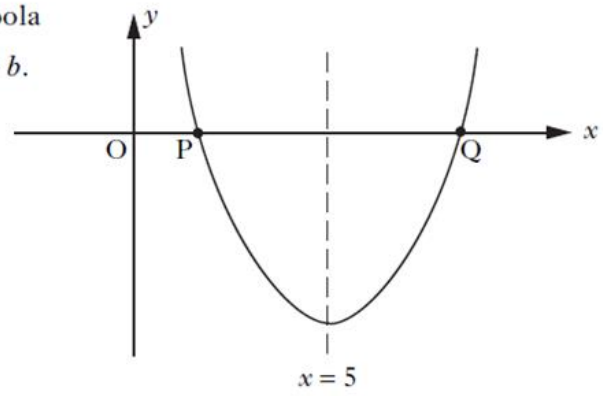


Find the coordinates of the turning point. **3**

Click here for video solution.

2010 - Paper 1 – Question 10

The graph below shows part of a parabola with equation of the form $y = (x + a)^2 + b$.



The equation of the axis of symmetry of the parabola is $x = 5$.

(*a*) State the value of a. **1**

(*b*) P is the point (2, 0). State the coordinates of Q. **1**

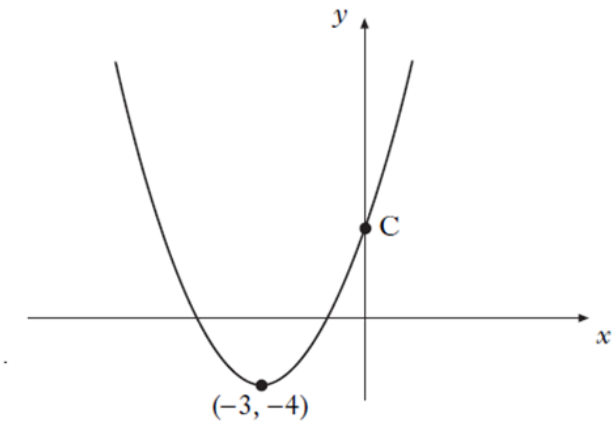
(*c*) Calculate the value of b. **2**

Click here for video solution.

2009 - Paper 1 - Question 9

The diagram below shows part of a parabola with equation of the form

$$y = (x + a)^2 + b.$$



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

(b) Write down the equation of the parabola. 2

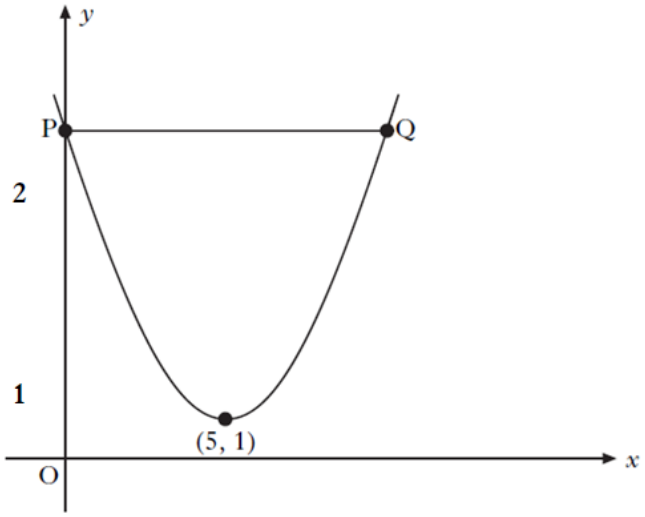
(c) Find the coordinates of C. 2

Click here for video solution.

2008 - Paper 1 - Question 9

The graph below shows part of a parabola with equation of the form

$$y = (x + a)^2 + b.$$



(a) State the values of a and b.

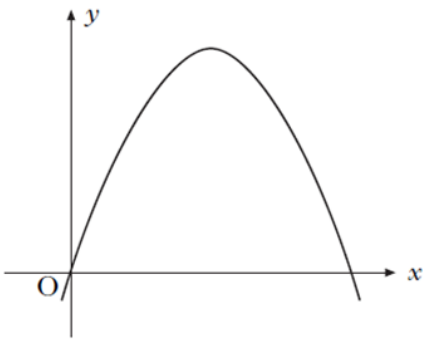
(b) State the equation of the axis of symmetry of the parabola.

(c) The line PQ is parallel to the x-axis.
Find the coordinates of points P and Q. 3

Click here for video solution.

2007 - Paper 1 - Question 7

The graph shown below is part of the parabola with equation $y = 8x - x^2$.



(a) By factorising $8x - x^2$, find the roots of the equation

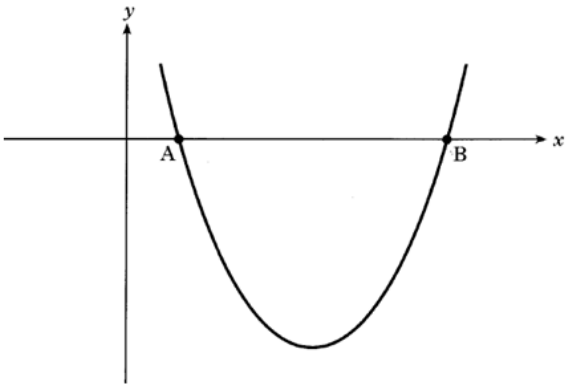
$$8x - x^2 = 0.$$ 2

(b) State the equation of the axis of symmetry of the parabola. 1

(c) Find the coordinates of the turning point. 2

Click here for video solution.

2006 - Paper 1 - Question 7



The equation of the parabola in the above diagram is

$$y = (x - 3)^2 - 4.$$

(a) State the coordinates of the minimum turning point of the parabola. 2

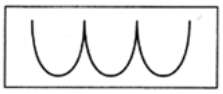
(b) State the equation of the axis of symmetry of the parabola. 1

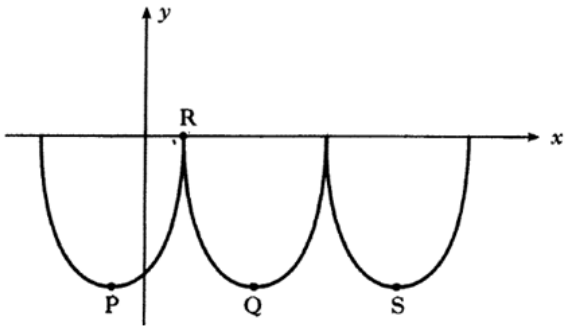
(c) A is the point (1, 0). State the coordinates of B. 1

Click here for video solution.

2004 - Paper 1 - Question 5

William Watson's Fast Foods use a logo based on parts of three identical parabolas.
This logo is represented on the diagram below.





The first parabola has turning point P and equation $y = (x + 2)^2 - 16$.

(a) State the coordinates of P. **2**

(b) If R is the point (2, 0), find the coordinates of Q, the minimum turning point of the second parabola. **1**

(c) Find the equation of the parabola with turning point S. **2**

Click here for video solution.

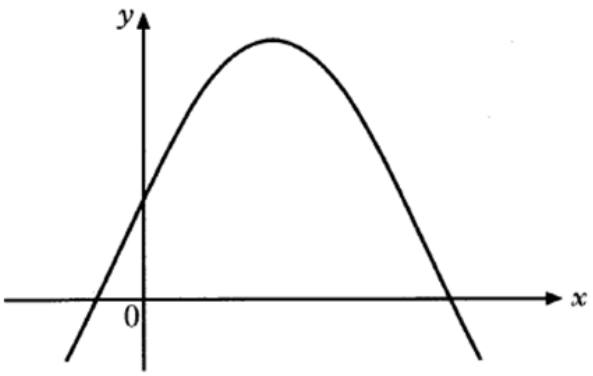
2003 - Paper 1 - Question 8

(a) Factorise $7 + 6x - x^2$. **2**

(b) Hence write down the roots of the equation

$$7 + 6x - x^2 = 0.$$ **1**

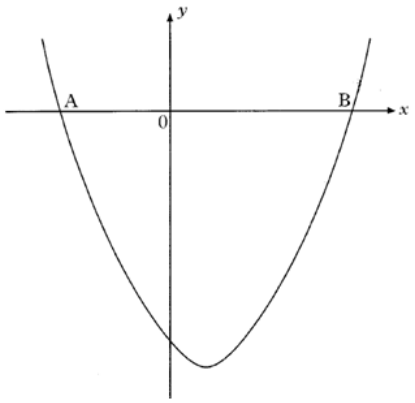
(c) The graph of $y = 7 + 6x - x^2$ is shown in the diagram.



Find the coordinates of the turning point. **3**

Click here for video solution.

2002 - Paper 1 - Question 6



The equation of the parabola in the above diagram is

$$y = (x - 1)^2 - 16.$$

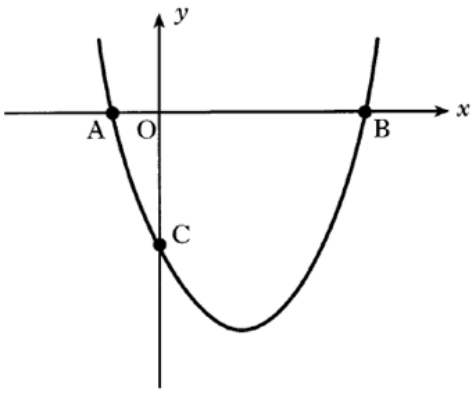
(*a*) State the coordinates of the minimum turning point of the parabola. **2**

(*b*) State the equation of the axis of symmetry of the parabola. **1**

(*c*) The parabola cuts the x-axis at A and B. Find the length of AB. **3**

Click here for video solution.

2001 - Paper 2 - Question 5



The equation of the parabola in the above diagram is

$$y = (x - 2)^2 - 9.$$

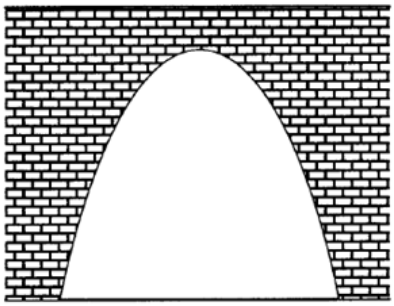
(*a*) State the coordinates of the minimum turning point of the parabola. **2**

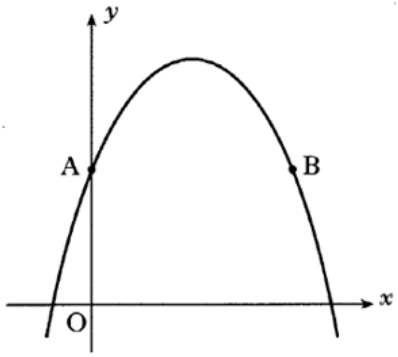
(*b*) Find the coordinates of C. **2**

(*c*) A is the point (–1, 0). State the coordinates of B. **1**

Click here for video solution.

2000 - Paper 2 - Question 10





The arch of a railway bridge is represented by a parabola. The equation of the parabola is

$$y = 20 - (x - 3)^2.$$

(*a*) State the coordinates of the maximum turning point of the parabola. **2**

(*b*) State the equation of the axis of symmetry. **1**

(*c*) Points A and B have the same y-coordinate.
A is the point (0, 11). State the coordinates of B. **2**

Click here for video solution.