

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Algebra

Interpreting graphs of quadratic functions

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

- In all calculations, show clearly how you work out your answer

Questions 1 to 4 are **higher** tier only

For questions 1 to 4 you must **NOT** use a calculator.



Q1.

The equation of a curve is $y = (x + 3)^2 + 5$

Which of these are the coordinates of the turning point?

(5, 3)

(5, -3)

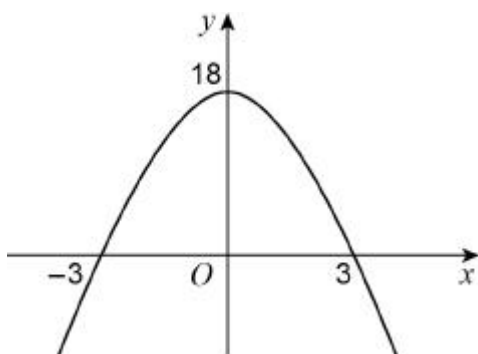
(3, 5)

(-3, 5)

(Total 1 mark)

Q2.

A quadratic curve intersects the axes at $(-3, 0)$, $(3, 0)$ and $(0, 18)$



Not drawn
accurately

Work out the equation of the curve.

(Total 3 marks)

Q3.

A graph has the equation $y = x^2 + px + r$ where p and r are constants.

The graph passes through the points $(0, 4)$, $(1, 3)$ and $(8, w)$

Work out the value of w .

(Total 4 marks)

Q4.

The turning point of the graph $y = (x + a)^2 + b$ has x -coordinate -2 .

$(3, 1)$ is another point on the graph.

Work out the y -coordinate of the turning point.

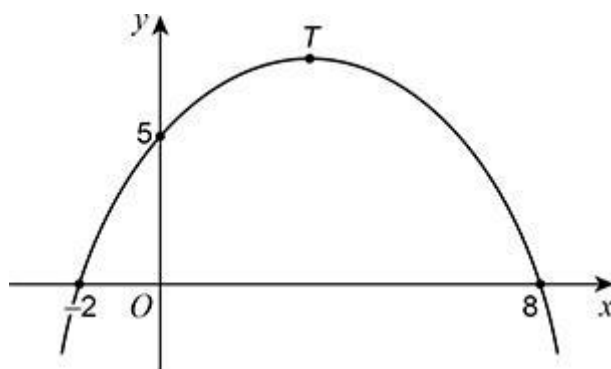
(Total 3 marks)

For the rest of the questions, you may use a calculator.



Q5.

Here is a sketch of a quadratic graph.

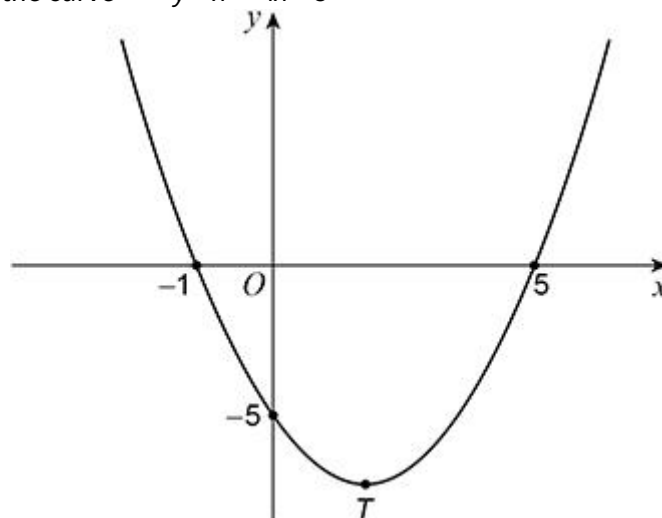


Complete the following statements.

(Total 2 marks)

Q6.

Here is a sketch of the curve $y = x^2 - 4x - 5$



(a) Write down the **two** roots of $x^2 - 4x - 5 = 0$

(1)

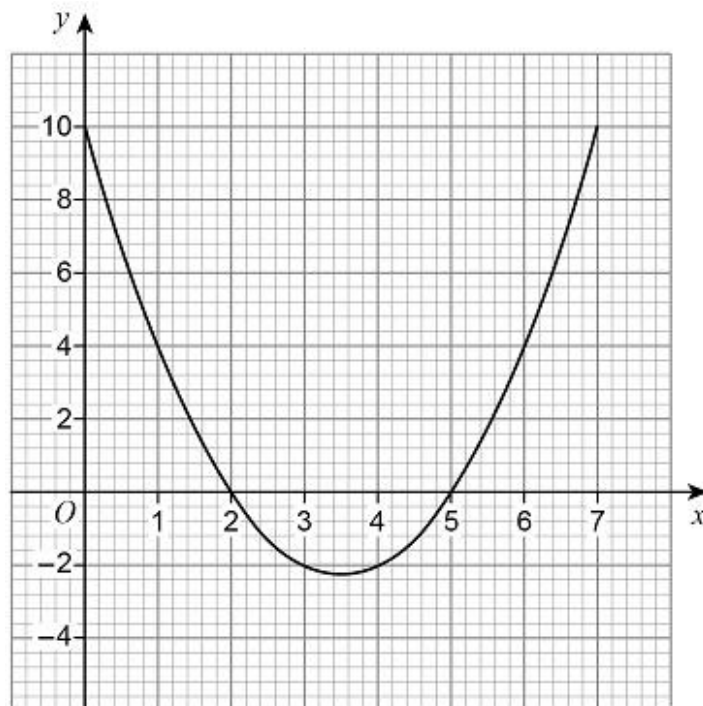
(b) Work out the coordinates of T , the turning point of the curve.

(2)

(Total 3 marks)

Q7.

Here is the graph of $y = x^2 - 7x + 10$ for values of x from 0 to 7



(a) Write down the roots of $x^2 - 7x + 10 = 0$

(2)

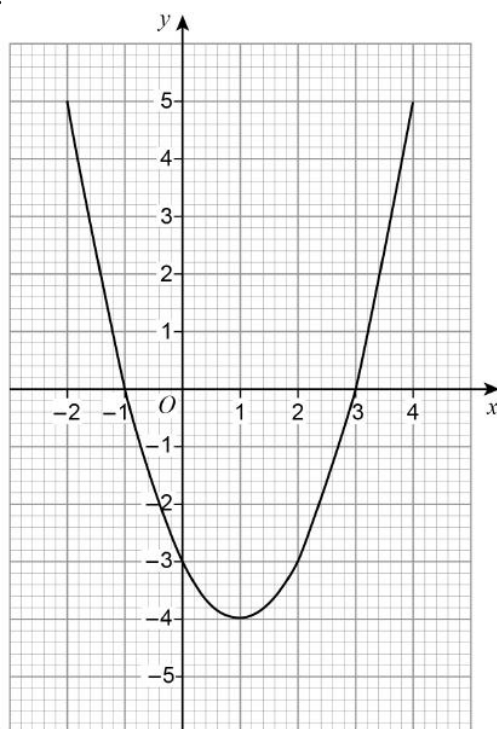
(b) Write down the x -coordinate of the turning point of the curve.

(1)

(Total 3 marks)

Q8.

Here is a quadratic graph.



Which of these is the x -coordinate of the turning point of the graph?

-4 -1 1 3

(Total 1 mark)

Questions 9 to 13 are **higher** tier only

Q9.

The equation of a curve is $y = (x - 1)^2 - 6$

Which of these are the coordinates of the turning point?

$(-1, -6)$

$(1, 6)$

$(-1, 6)$

$(1, -6)$

(Total 1 mark)

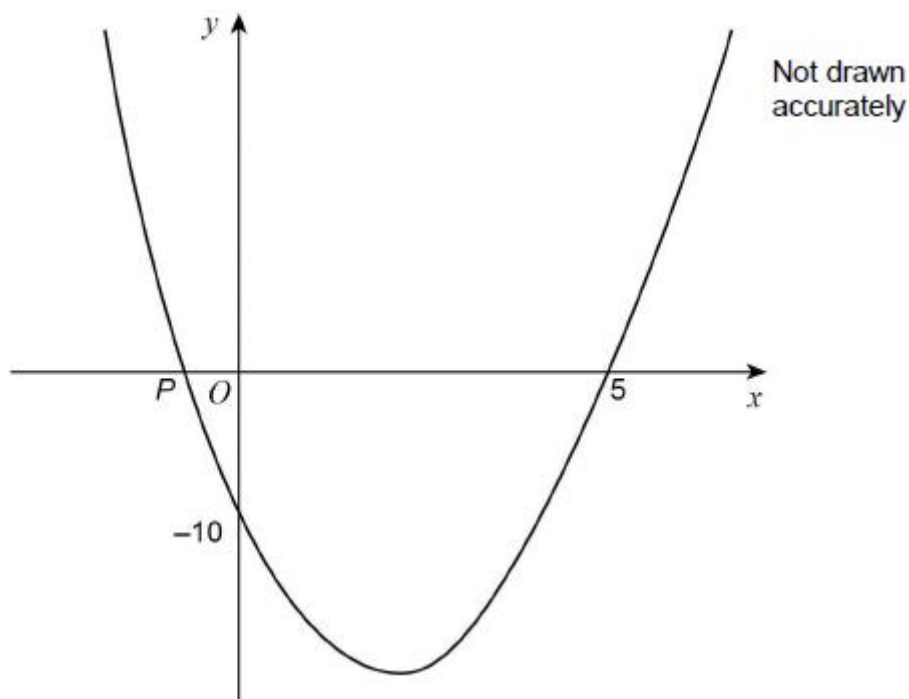
Q10.

Here is a sketch of $y = x^2 + bx + c$

The curve intersects

the x -axis at $(5, 0)$ and point P

the y -axis at $(0, -10)$

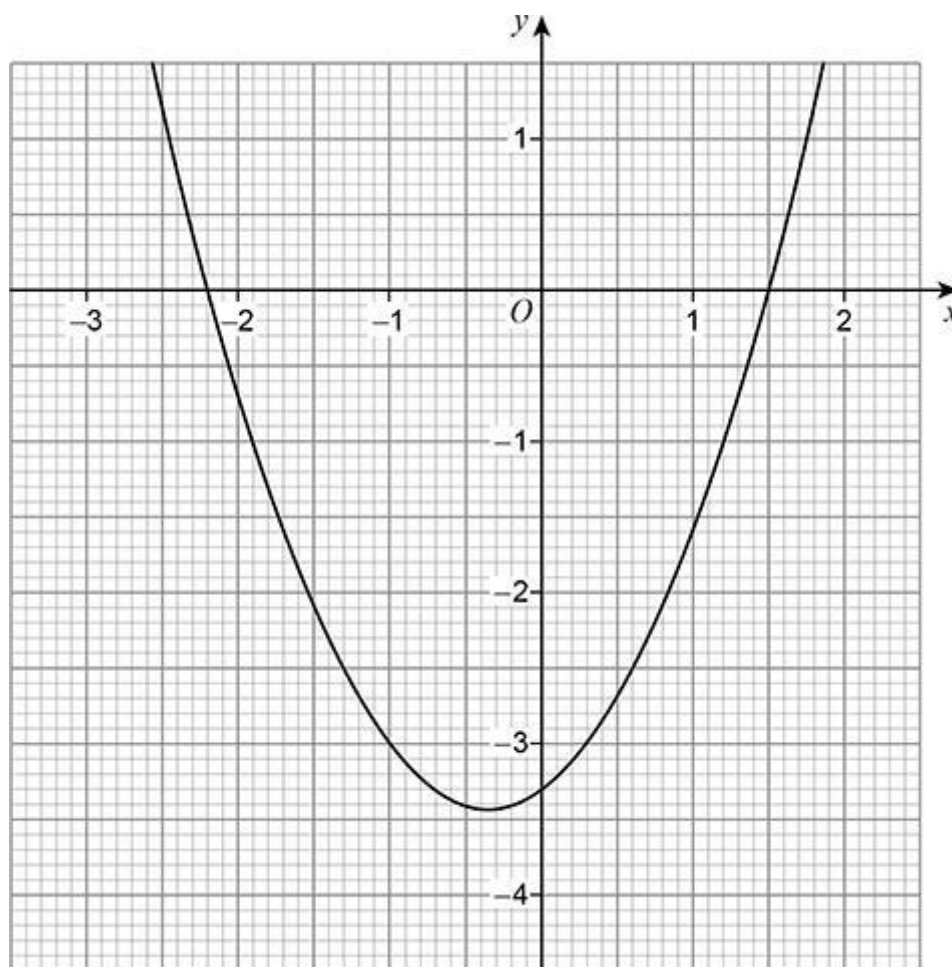


Work out the x -coordinate of the turning point of the graph.

(Total 4 marks)

Q11.

Here is a quadratic graph with equation $y = f(x)$

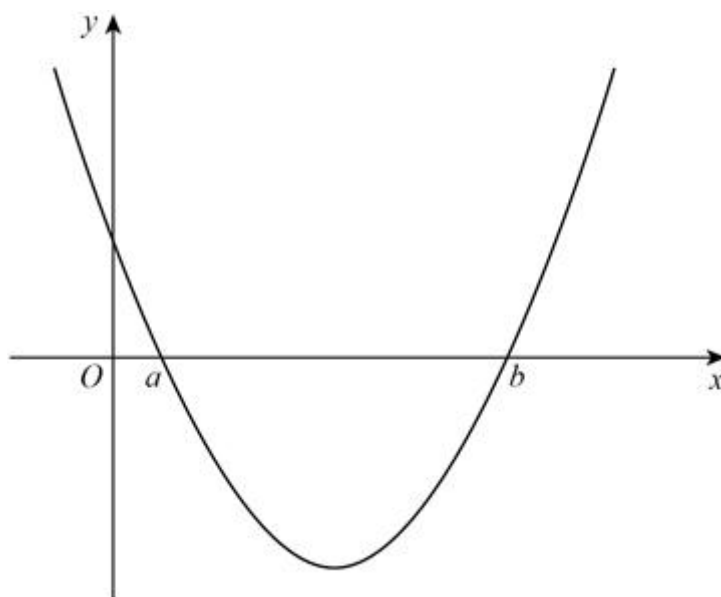


Write down the roots of the equation $f(x) = 0$

(Total 2 marks)

Q12.

Here is a sketch of the quadratic graph $y = f(x)$
The graph crosses the x -axis at $x = a$ and $x = b$



Write an expression for the x -coordinate of the turning point.

(Total 1 mark)

Q13.

A graph passes through the points $(3, 15)$ and $(7, w)$

- (a) Assume that the equation of the graph has the form $y = x^2 + c$
Work out the value of w that this would give.

(3)

- (b) In fact, the graph is a straight line.
What does this mean about the actual value of w ?
Tick **one** box.

☐
☐
☐

It must be the same as the value in part (a)

It must be different to the value in part (a)

It is impossible to tell

(1)

(Total 4 marks)