

Sketching Graphs and Exponential Graphs

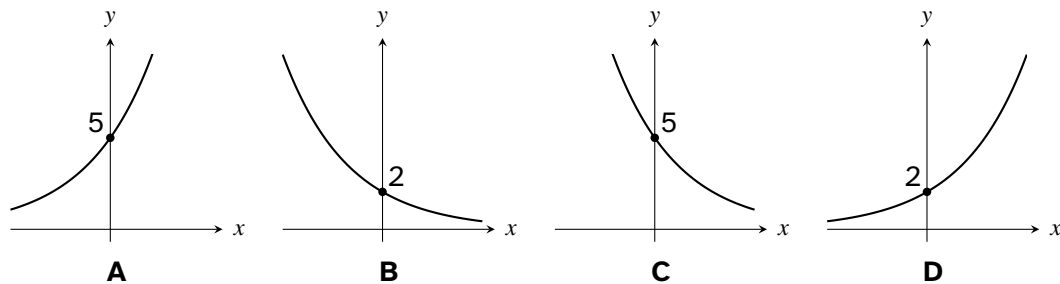
For AQA Level 2 Certificate in Further Mathematics (8365)

Name _____

Total marks: **27**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator.

1 Here are four sketches.



Which sketch shows the graph of $y = 5 \times 2^{-x}$?
Circle your answer.

[1 mark]

A

B

C

D

2 A quadratic curve has a turning point at $(3, -2)$

Which of these could be its equation?

Circle your answer.

[1 mark]

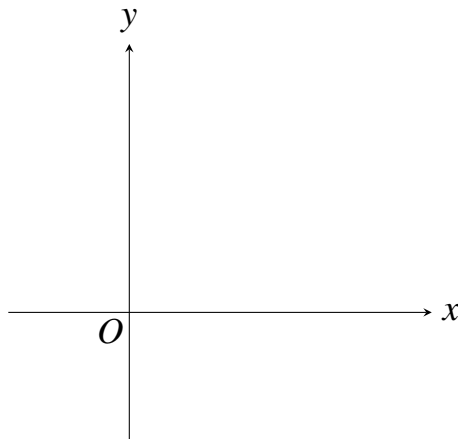
$y = (x + 3)^2 - 2$

$y = (x - 3)^2 + 2$

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

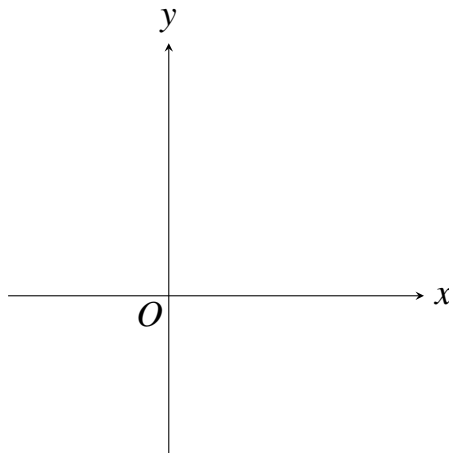
$y = (x + 2)^2 - 3$

- 3** Sketch the graph of $y = (3 - x)(2x + 1)$
Label the coordinates of the points where the graph meets the axes.



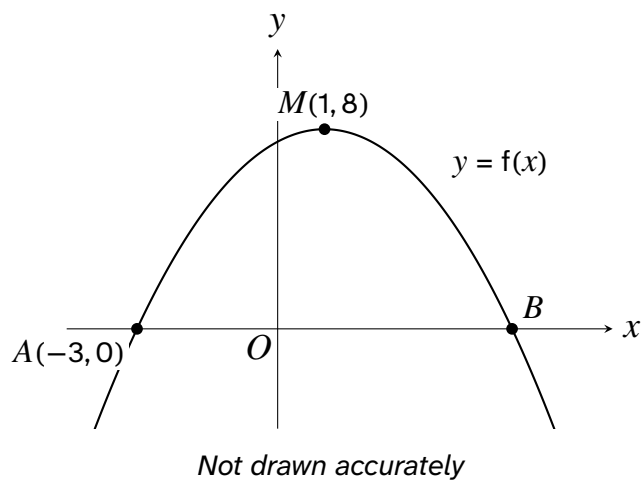
[3 marks]

- 4** Sketch the graph of $y = (x + 1)(x - 2)^2$
Label the coordinates of the points where the graph meets the axes.



[3 marks]

- 5 The sketch shows the graph of the quadratic function $y = f(x)$.
The graph crosses the x -axis at $A(-3, 0)$ and at B .
Its highest point is $M(1, 8)$



- (a) Write down the coordinates of B .

[1 mark]

Answer (_____ , _____)

- (b) Work out $f(x)$
Give your answer in the form $ax^2 + bx + c$

[3 marks]

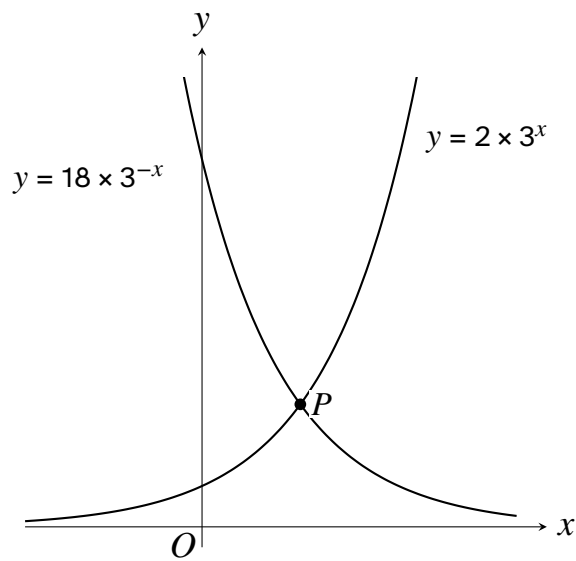
$f(x) =$ _____

- (c) The line $y = k$ does not meet the curve.
Write down the possible values of k .
Give your answer as an inequality.

[1 mark]

Answer _____

- 6 The sketch shows the curves $y = 2 \times 3^x$ and $y = 18 \times 3^{-x}$
The curves intersect at P .



Not drawn accurately

- (a) Write down the coordinates of the point where the curve $y = 18 \times 3^{-x}$ crosses the y -axis.

[1 mark]

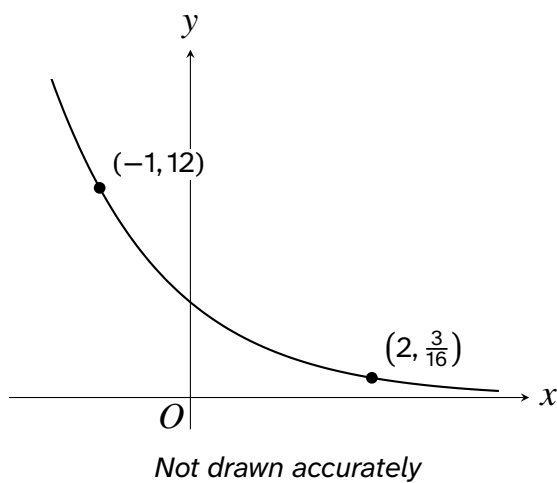
Answer (_____ , _____)

- (b) Work out the coordinates of P .
You must show your working.

[3 marks]

Answer (_____ , _____)

- 7 The graph of $y = a \times b^{-x}$ goes through the points $(-1, 12)$ and $(2, \frac{3}{16})$
 $a > 0$ and $b > 0$



- (a) Work out the value of a and the value of b .

[4 marks]

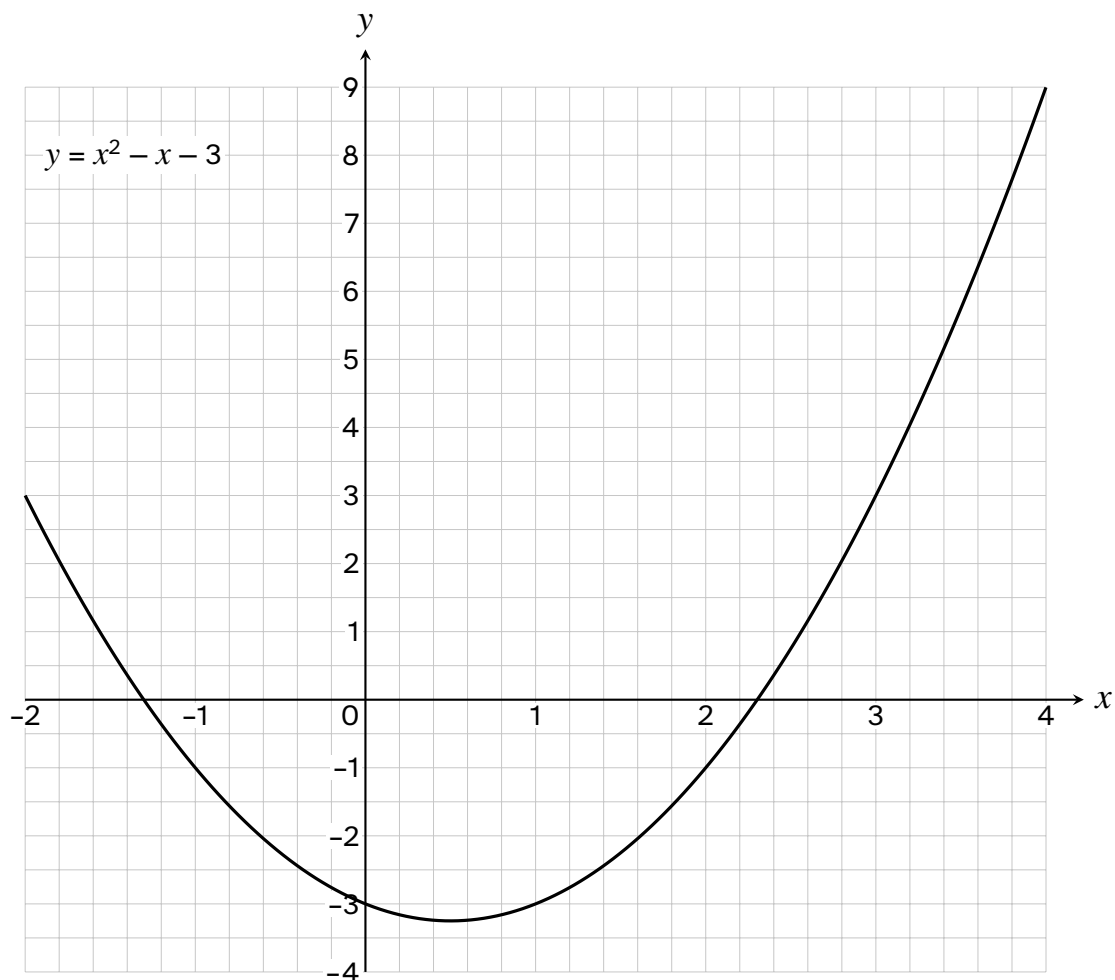
$a =$ _____ $b =$ _____

- (b) Work out the value of x when $y = 48$

[2 marks]

$x =$ _____

- 8 Here is the graph of $y = x^2 - x - 3$ for values of x from -2 to 4



By drawing a suitable straight line on the grid, solve $2x^2 - 3x - 10 = 0$
Give your answers to 1 decimal place.

[4 marks]

Answer _____