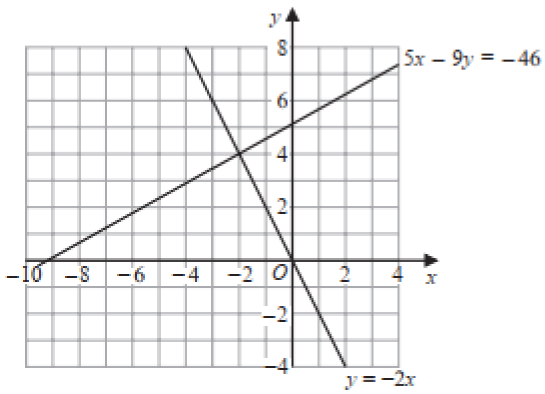
SOLVING SIMULTANEOUS EQUATIONS GRAPHICALLY

Pearson Edexcel – Monday 8 June 2020 - Paper 3 (Calculator) Higher Tier

1.

6



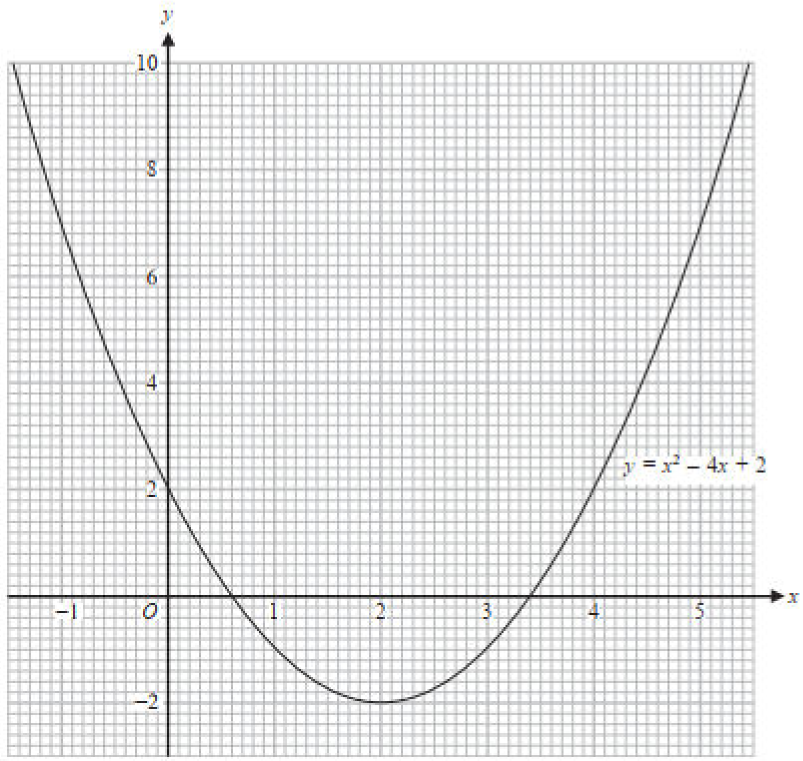
(a) Use these graphs to solve the simultaneous equations

$$5x - 9y = -46$$
$$y = -2x$$

$x =$ ....

$y =$ ....

(1)



(b) Use this graph to find estimates for the solutions of the quadratic equation $x^2 - 4x + 2 = 0$

....

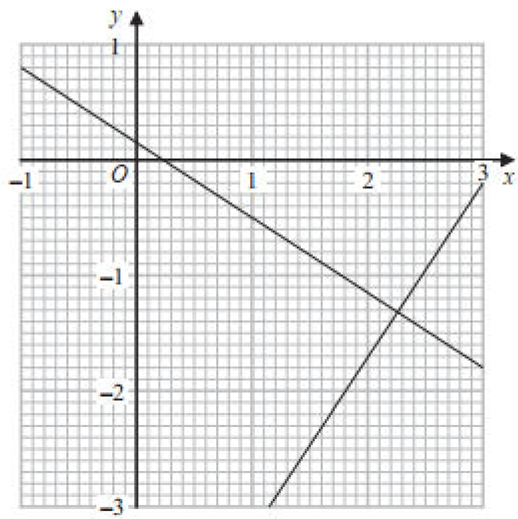
(2)

(Total for Question 6 is 3 marks)

Pearson Edexcel - Tuesday 21 May 2019 - Paper 1 (Non-Calculator) Higher Tier

2.

10 The graphs with equations $3y + 2x = \frac{1}{2}$ and $2y - 3x = -\frac{113}{12}$ have been drawn on the grid below.



Using the graphs, find estimates of the solutions of the simultaneous equations

$$3y + 2x = \frac{1}{2}$$

$$2y - 3x = -\frac{113}{12}$$

$x =$ ....

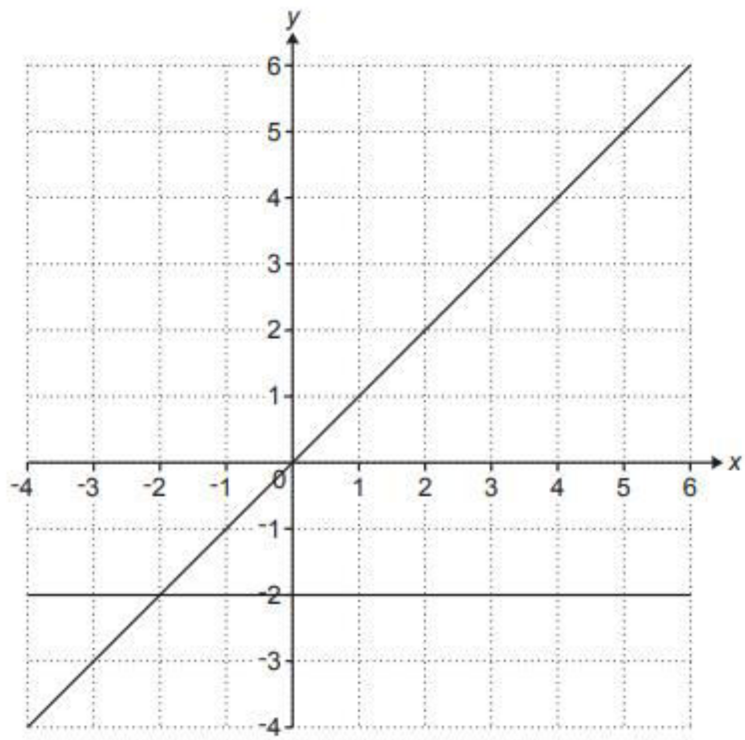
$y =$ ....

(Total for Question 10 is 2 marks)

OCR GSCE – Thursday 5 November 2020 – Paper 5 (Non-Calculator) Higher Tier

3.

17 The graphs of $y = x$ and $y = {}^{-}2$ are drawn on the grid.



The region R satisfies the following inequalities.

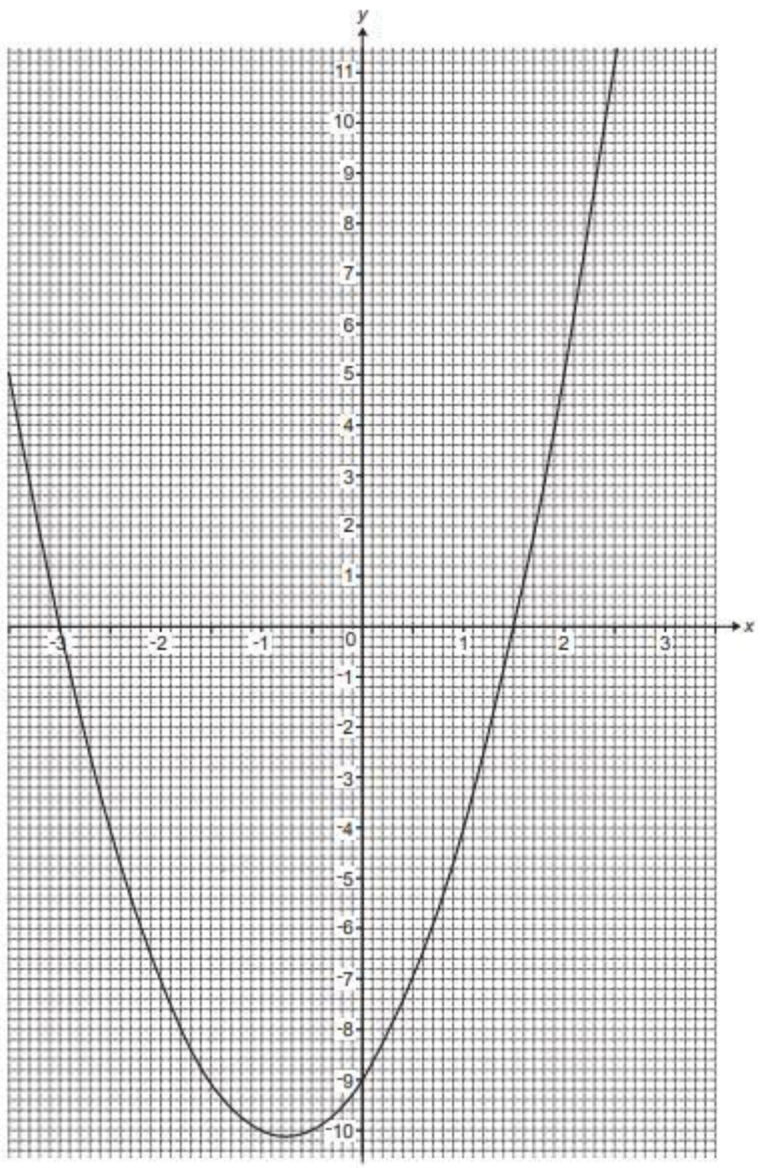
$y \geqslant {}^{-}2$ $\quad$ $y \leqslant x$ $\quad$ $y < 4 - 2x$

By drawing one more line, find and label the region R. **[5]**

OCR GSCE – Monday 9 November 2020 – Paper 6 (Calculator) Higher Tier

4.

19 The graph of $y = 2x^2 + 3x - 9$ is drawn below.



(a) Use the graph to solve $2x^2 + 3x - 9 = 0$.

(a) $x =$ .... or $x =$ .... **[2]**

(b) The equation $2x^2 + x - 4 = 0$ can be solved by finding the intersection of the graph of $y = 2x^2 + 3x - 9$ and the line $y = ax + b$.

(i) Find the value of *a* and the value of *b*.

(b)(i) $a =$ ....

$b =$ .... **[2]**

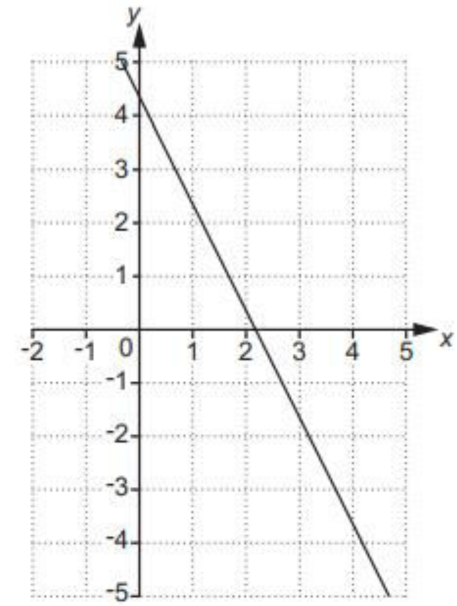
(ii) Hence **use the graph** to solve the equation $2x^2 + x - 4 = 0$.

(ii) $x =$ .... or $x =$ .... **[3]**

OCR GSCE – Thursday 7 November 2019 – Paper 5 (Non-Calculator) Higher Tier

5.

18 The graph of $3y + 6x = 13$ is drawn on the grid.



The region R satisfies these inequalities.

$3y + 6x \geqslant 13$ $\quad\quad$ $y \leqslant x - 2$ $\quad\quad$ $x > 3$

By drawing two more straight lines, find and label the region R. **[6]**

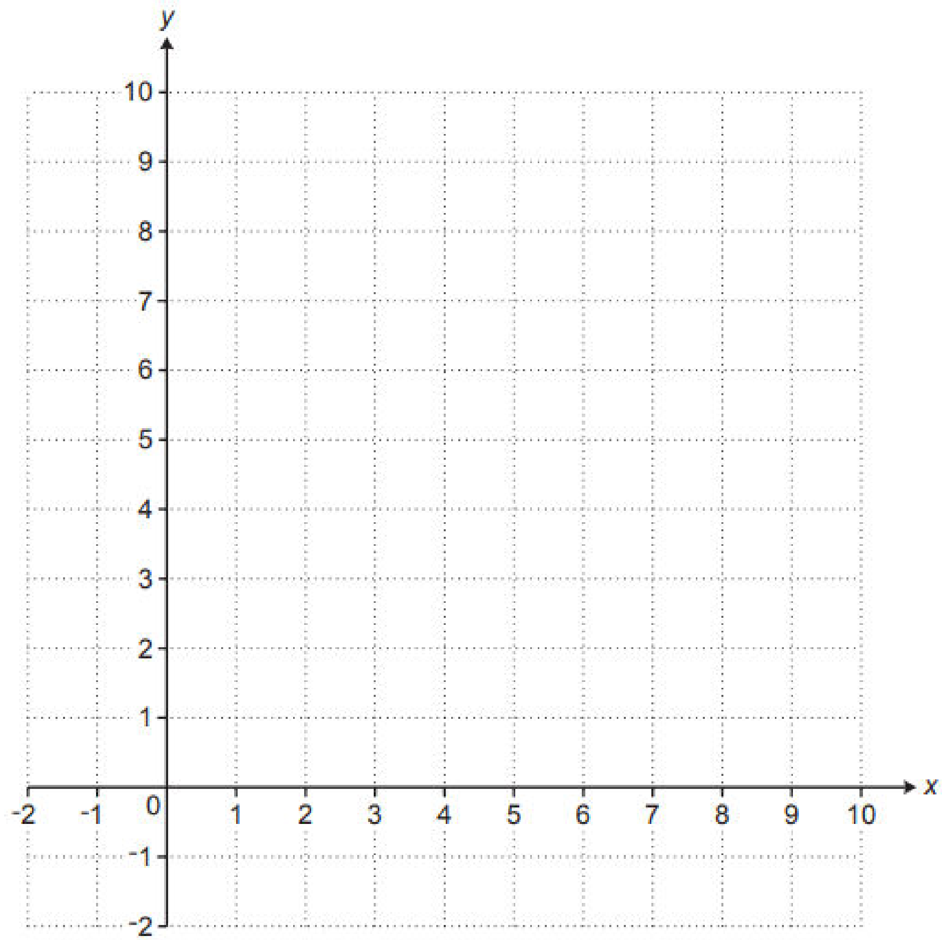
OCR GSCE – Tuesday 21 May 2019 – Paper 4 (Calculator) Higher Tier

6.

18 Region **R** satisfies these inequalities.

$$y > 3$$
$$y \geqslant x$$
$$x + y \leqslant 9$$

By drawing three straight lines on the grid, find and label the region **R**.

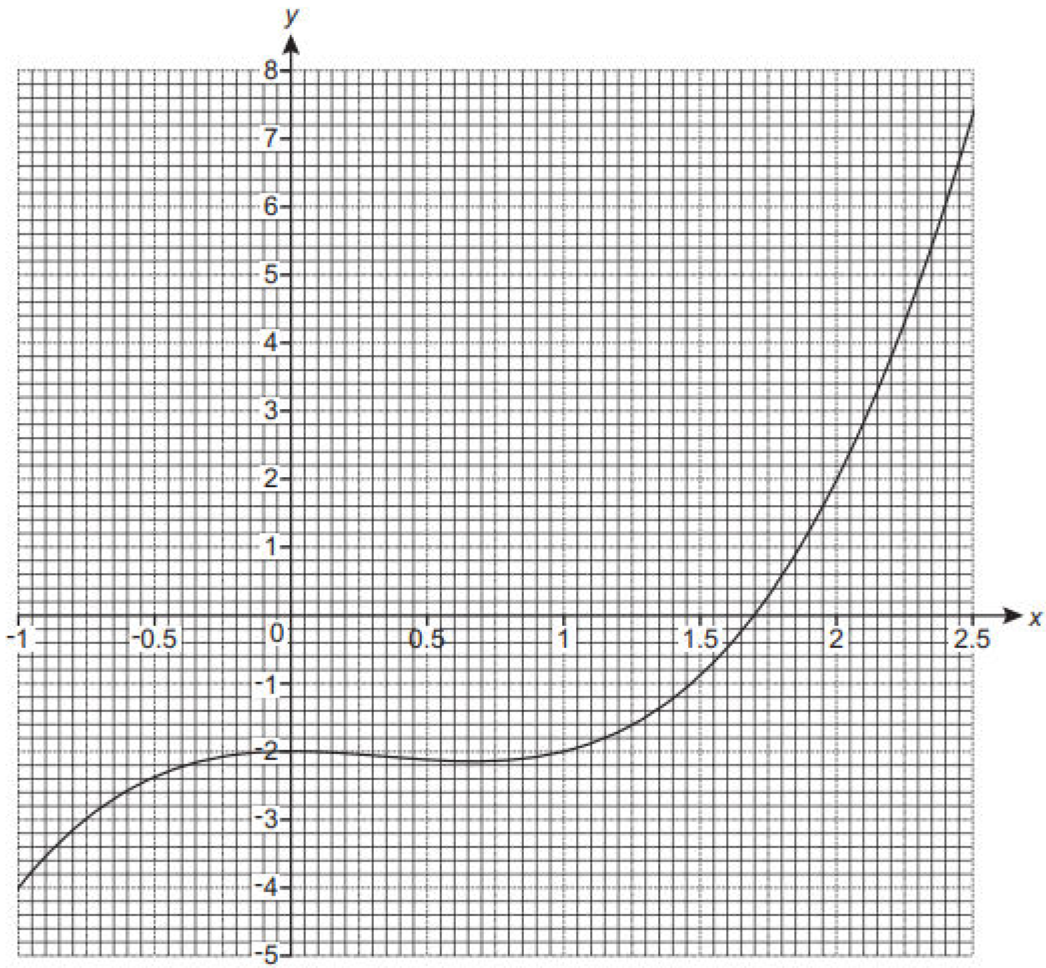


[6]

OCR GSCE – Thursday 6 June 2019 – Paper 5 (Non-Calculator) Higher Tier

7.

19 The graph of $y = x^3 - x^2 - 2$ is drawn on the grid.



(a) Use the graph to solve $x^3 - x^2 - 2 = 0$.
Give your answer correct to 1 decimal place.

$x =$ .... **[1]**

(b) The equation $x^3 - x^2 + 5x - 6 = 0$ can be solved by finding the intersection of the graph of $y = x^3 - x^2 - 2$ and the line $y = ax + b$.

(i) Find the value of a and the value of b.

(b)(i) $a =$ ....

$b =$ .... **[2]**

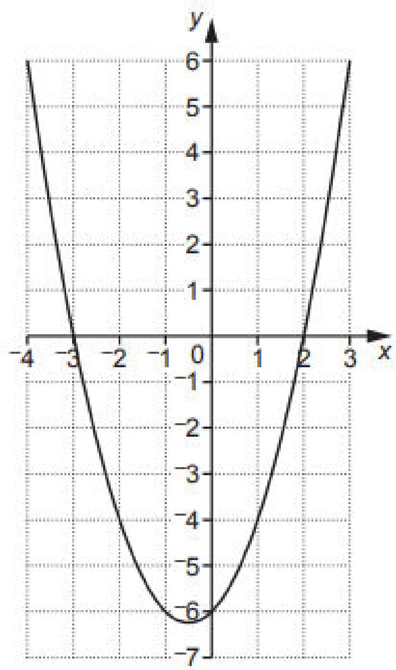
(ii) Hence, **use the graph** to solve the equation $x^3 - x^2 + 5x - 6 = 0$.
Give your answer correct to 1 decimal place.

(ii) $x =$ .... **[3]**

OCR GSCE – Tuesday 6 November 2018 – Paper 4 (Calculator) Higher Tier

8.

10 Here is the graph of $y = x^2 + x - 6$.



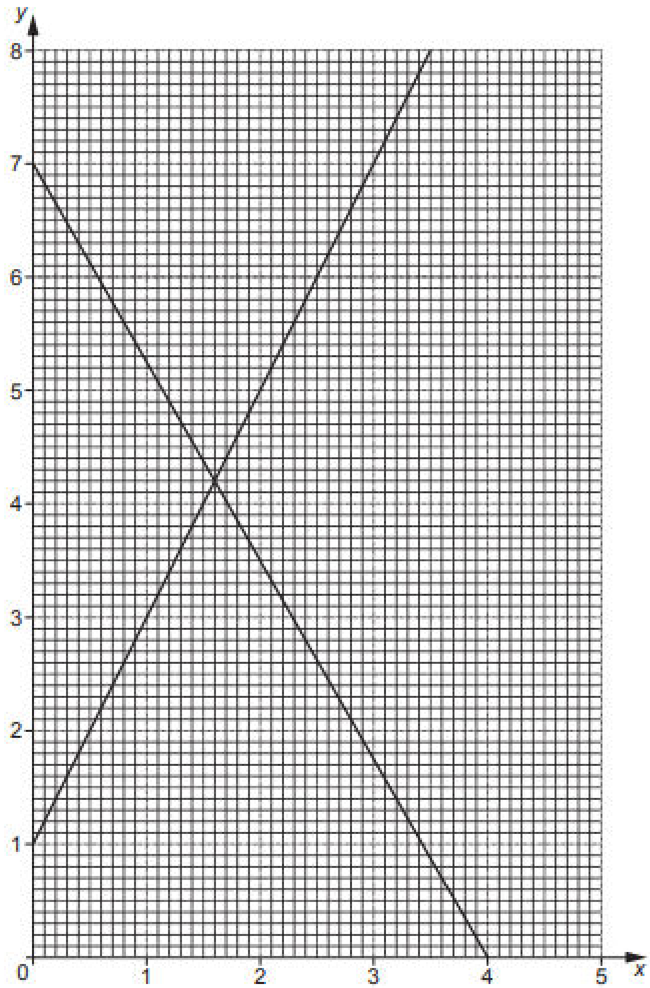
Use the graph to solve the equation $x^2 + x - 6 = 0$.

x = ... or x = ... **[2]**

OCR GSCE – Thursday 8 November 2018 – Paper 5 (Non-Calculator) Higher Tier

9.

14 The diagram shows the lines $y = 2x + 1$ and $7x + 4y = 28$.



The region R satisfies these inequalities.

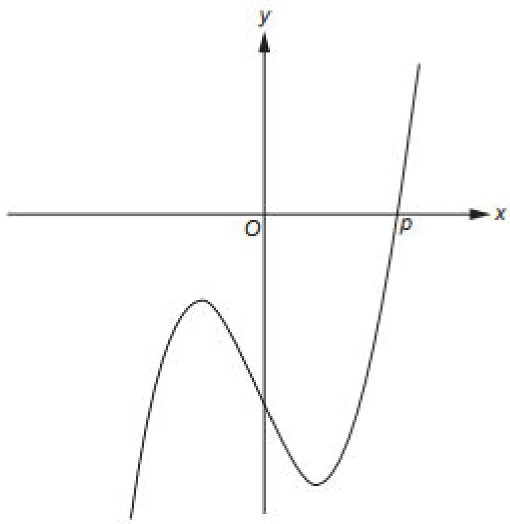
$y \leqslant 2x + 1$ $7x + 4y \geqslant 28$ $y > 1$

By drawing a third straight line, find and label the region R that satisfies these inequalities. **[5]**

OCR GSCE – Tuesday 12 June 2018 – Paper 6 (Calculator) Higher Tier

10.

9 The graph of $y = x^3 - 7x - 12$ is shown below.
The root of the equation $x^3 - 7x - 12 = 0$ is p.



(a) Calculate y when $x = 3$.

(a) $y =$ .... **[1]**

(b) Show that $3 < p < 4$. **[2]**

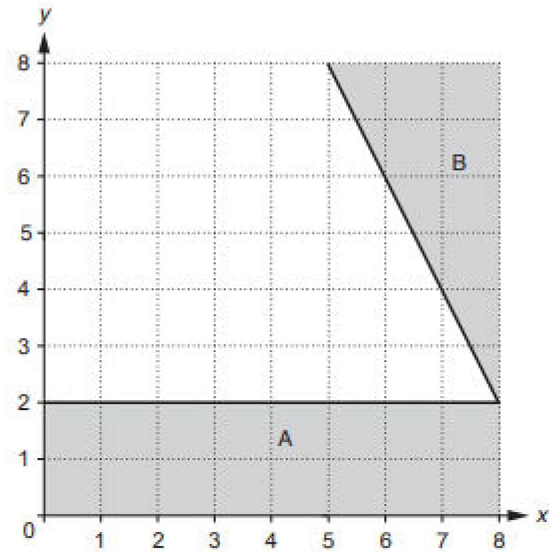
(c) Find a smaller interval that contains the value of p.
You must show calculations to support your answer.

(c) .... $< p <$ .... **[3]**

OCR GSCE – Wednesday 8 November 2017 – Paper 6 (Calculator) Higher Tier

11.

18 The diagram below shows a 1 cm coordinate grid.



(a) Find an inequality that defines region A and another inequality that defines region B.

(a) Region A: ....

Region B: .... **[4]**

(b) Shade the region on the grid given by the inequality $y \geqslant 6$. **[2]**

(c) A fourth shaded region, given by the inequality

$$y \geqslant kx + 2,$$

is added to the grid.

The **unshaded** region now has area 23 cm².

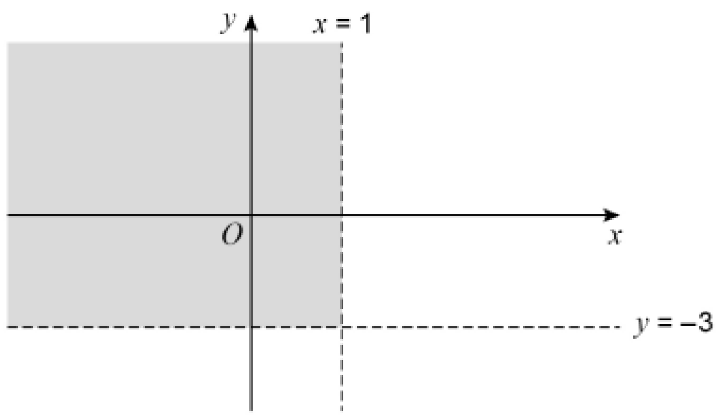
Find the value of *k*.

(c) $k =$ .... **[5]**

AQA GSCE – Thursday 8 June 2020 – Paper 3 (Calculator) Higher Tier

12.

19 The sketch shows the lines $x = 1$ and $y = -3$



Which pair of inequalities describes the shaded region?

Tick **one** box.

[1 mark]

☐ $x < 1$ and $y < -3$

☐ $x < 1$ and $y > -3$

☐ $x > 1$ and $y > -3$

☐ $x > 1$ and $y < -3$

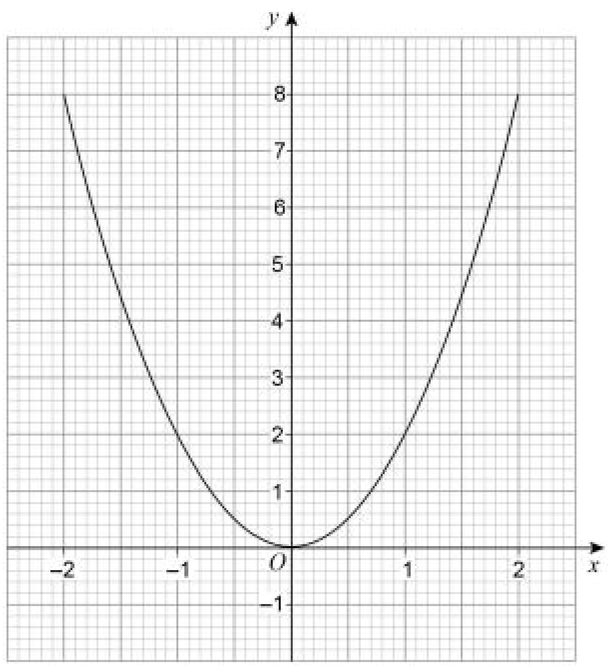
AQA GSCE – Thursday 6 November 2017 – Paper 2 (Calculator) Higher Tier

13.

21 (a) Meera is using a **graphical** method to solve $2x^2 - 3x = 0$

She draws the graph of $y = 2x^2$ and a straight line graph on the same grid.

Here is the graph of $y = 2x^2$



Complete her method to solve $2x^2 - 3x = 0$

[2 marks]

Answer ______________________

21 (b) Levi is solving $2x^2 + 5x = 0$

He uses this method.

$2x^2 + 5x = 0$	subtract $5x$ from both sides
$2x^2 = -5x$	divide both sides by x
$2x = -5$	divide both sides by 2
$x = -2.5$	

Evaluate his method and his answer.

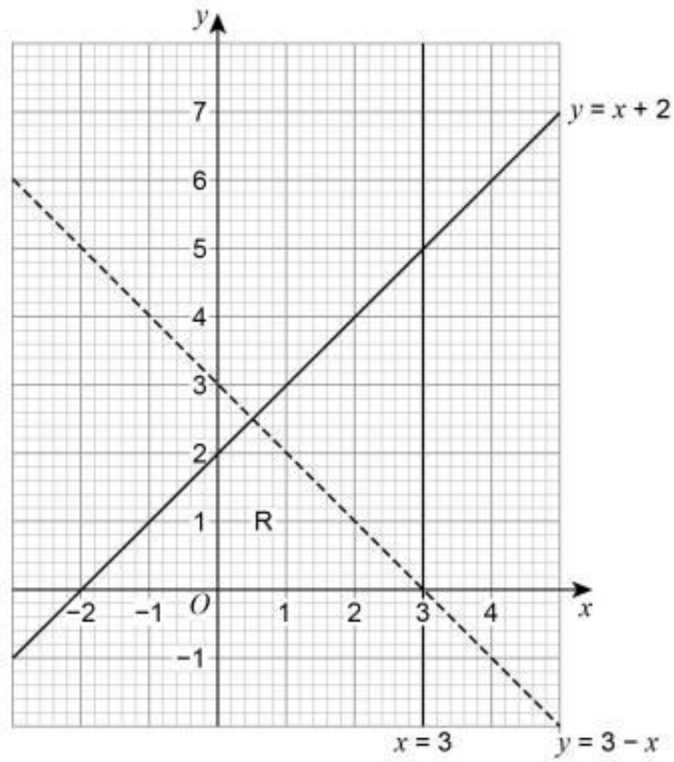
[2 marks]

AQA GSCE – Wednesday 8 November 2017 – Paper 3 (Calculator) Higher Tier

14.

23 Joe draws this graph to identify the region R represented by

$$y \leqslant x + 2 \quad \text{and} \quad y > 3 - x \quad \text{and} \quad x < 3$$



Make **two** criticisms of his graph.

[2 marks]

Criticism 1 ______________________________

____

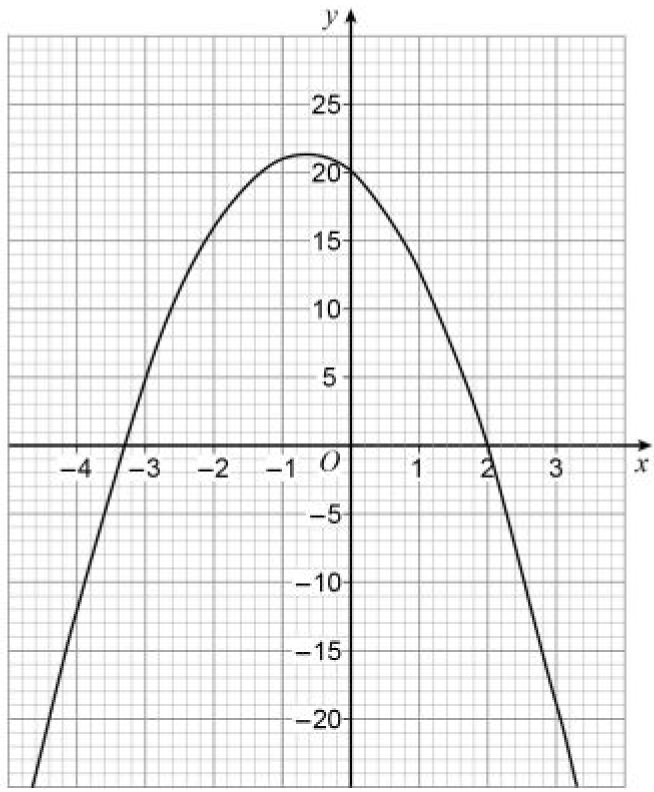
Criticism 2 ______________________________

____

AQA GSCE – Wednesday 8 November 2017 – Paper 3 (Calculator) Higher Tier

15.

29 Here is the graph of $y = f(x)$ where $f(x)$ is a quadratic function.



Write down all the **integer** solutions of $f(x) \geqslant 0$

[2 marks]

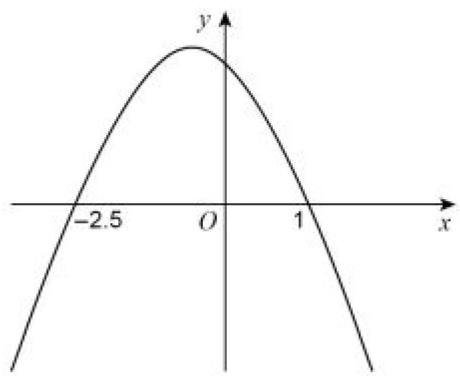
Answer ______________________________

AQA GSCE – Tuesday 13 June 2017 – Paper 3 (Calculator) Higher Tier

16.

21 Here is a sketch of $y = f(x)$ where $f(x)$ is a quadratic function.

The graph intersects the x-axis where $x = -2.5$ and $x = 1$



Not drawn accurately

Circle the solution of $f(x) > 0$

[1 mark]

$x < -2.5$ or $x > 1$ $\qquad$ $x > -2.5$ or $x > 1$

$-2.5 < x < 1$ $\qquad$ $x > -2.5$ or $x < 1$