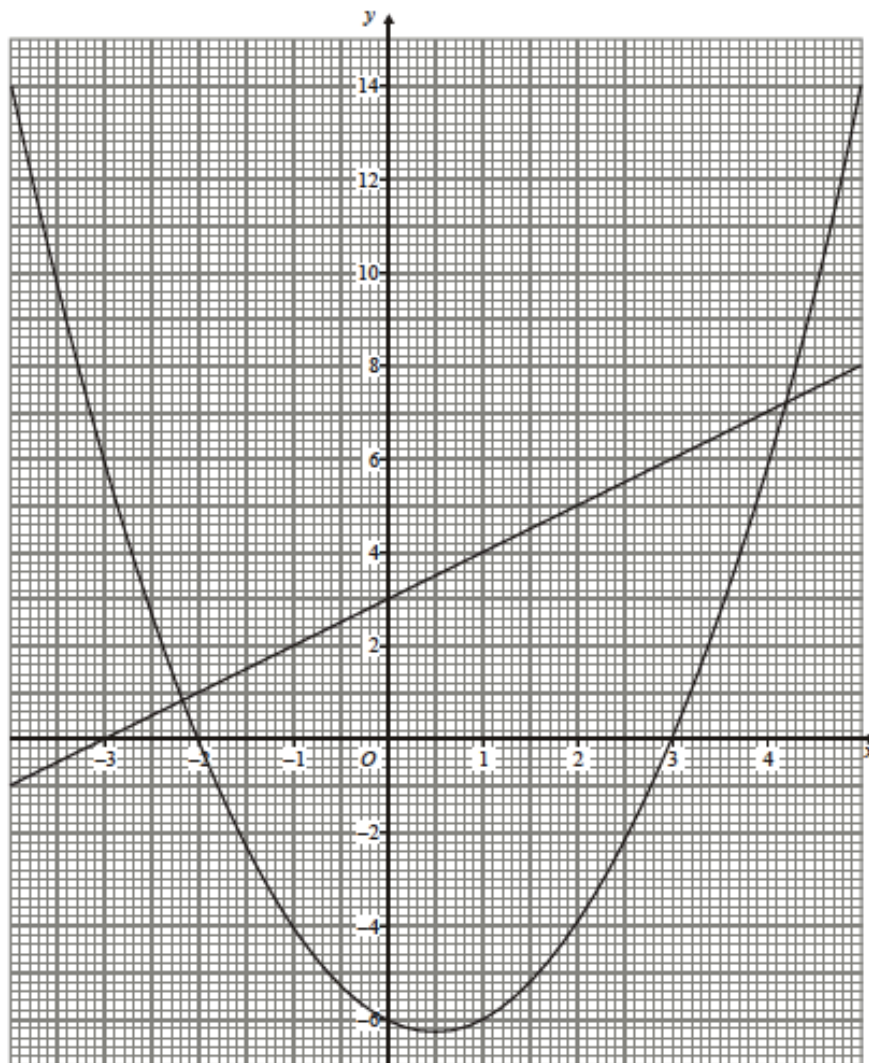


Topic 24 Inequalities and graphs (Post-TT) [36]

1.

The diagram shows the graphs $y = x^2 - x - 6$ and $y = x + 3$



(a) Use the graph of $y = x^2 - x - 6$ to write down the solutions of the equations

(i) $x^2 - x - 6 = 0$

(1)

(ii) $x^2 - x - 6 = -2$

(2)

(b) Find the quadratic equation whose solutions are the x -coordinates of the points of intersection of

$$y = x^2 - x - 6 \text{ and } y = x + 3$$

Give your answer in the form $x^2 + bx + c = 0$

(2)

(c) Find the equation of the straight line that should be drawn on the diagram to solve the equation $x^2 - 2x - 4 = 0$

(2)

(Total 7 marks)

2.

Solve the inequality: $x^2 - x - 20 < 0$.

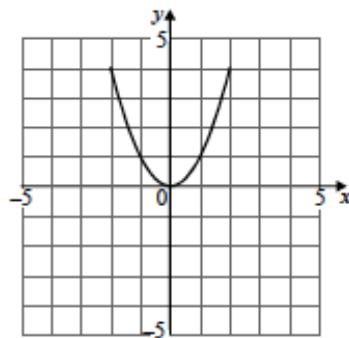
[Total 4 marks]

3. On a grid from 0 to 8 on both the x – and y – axis, shade the region that satisfies these inequalities: $x \geq -4$ $y \geq 2$ $x + y \leq 6$

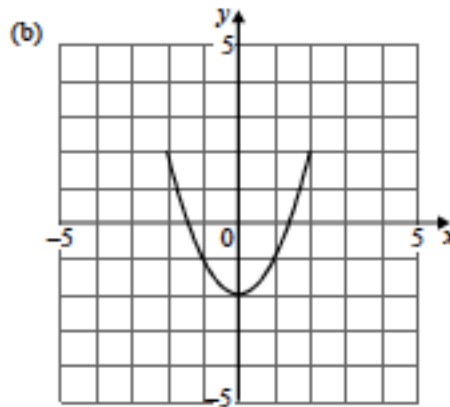
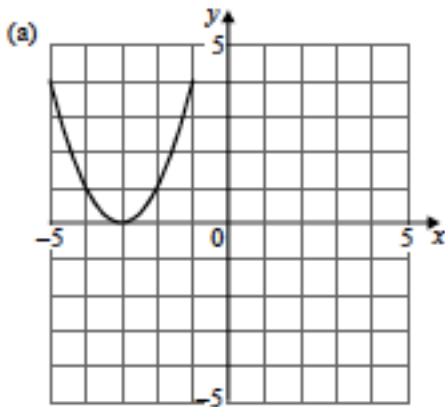
(Total 4 marks)

4.

The diagram shows the graph of $y = x^2$ for $-2 \leq x \leq 2$.



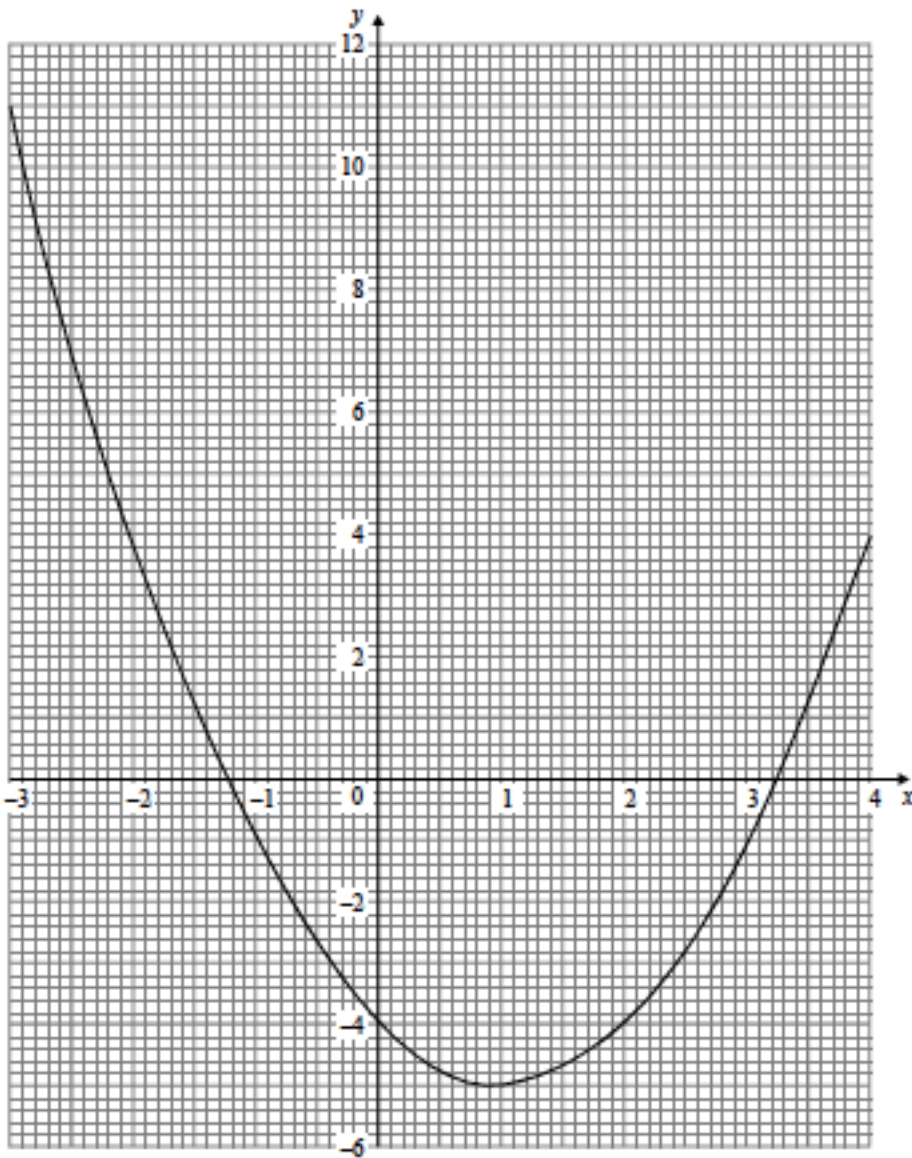
Each of the graphs below is a transformation of this graph.
Write down the equation of each graph.



(Total 2 marks)

5.

The graph $y = x^2 - 2x - 4$ is drawn below for values of x between -3 and $+4$.



(a) Using the graph, find the solutions of $x^2 - 2x - 4 = 0$, giving your answers to 1 decimal place.

(1)

(b) By drawing an appropriate linear graph, write down the solutions of

$$x^2 - 3x - 2 = 0$$

(3)

(Total 4 marks)

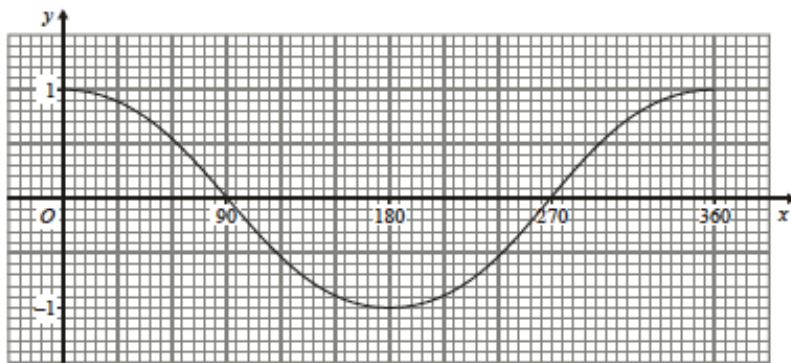
6.

Solve the inequality: $(2 + x)(1 - x) < 0$.

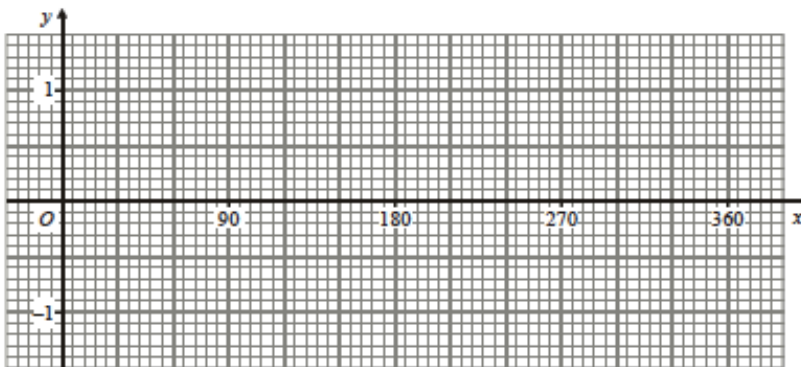
(Total 3 marks)

7.

This is the graph of $y = \cos x$ for $0^\circ \leq x \leq 360^\circ$

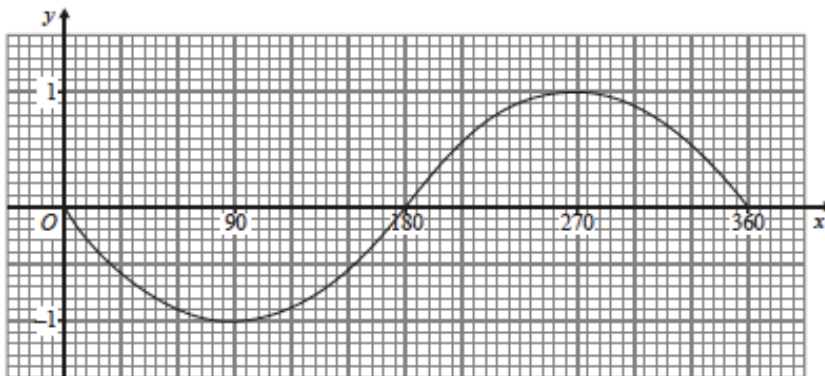


(a) On the axes below draw the graph of $y = \cos(x - 90)$ for $0^\circ \leq x \leq 360^\circ$



(2)

(b) Write down a possible equation of the following graph.



(1)

(Total 3 marks)

8.

The values of x and y are *integers*.

On a grid from 0 to 8 on both the x – and y – axis, mark with a cross (x) each of the 6 points which satisfies these inequalities: $-2 < x \leq 1$ $y > -2$ $y < x + 1$
(Total 4 marks)

9.

Work out the integer values that satisfy $x^2 - 7x + 11 < 0$.

[Total 5 marks]