A7

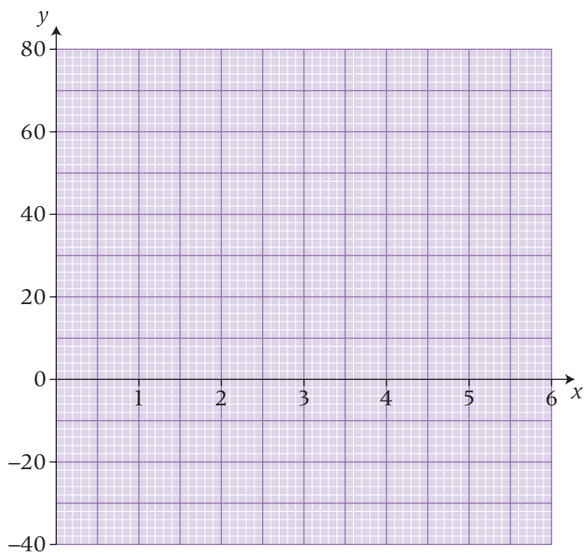
Algebra exam review

1 **a** Complete the table of values for the graph of $y = 4x(11 - 2x)$

x	0	1	2	3	4	5	6
y	0			60			−24

(2)

b On the grid, draw the graph of $y = 4x(11 - 2x)$



(2)

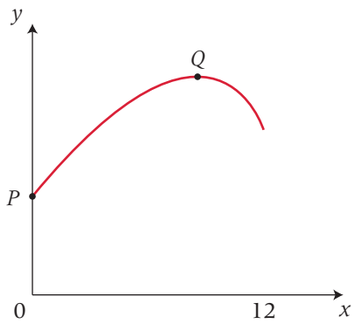
c Use your graph to find the maximum value of y.

.....

(1)

(Total 5 marks)

2 Here is a sketch of the graph of $y = 25 - \frac{(x-8)^2}{4}$ for $0 \leqslant x \leqslant 12$



P and *Q* are points on the graph.

P is the point at which the graph meets the *y*-axis.

Q is the point at which y has its maximum value.

a Find the coordinates of

i *P*,

(....., ...)

ii *Q*.

(....., ...)

(3)

b Show that $25 - \frac{(x-8)^2}{4} = \frac{(2+x)(18-x)}{4}$

(3)

(Total 6 marks)

3 Peter cuts a square out of a rectangular piece of metal.

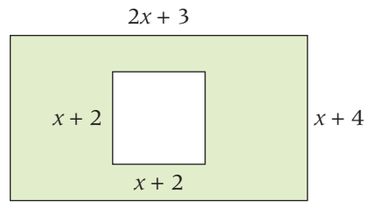


Diagram **NOT** accurately drawn

The length of the rectangle is $2x + 3$.
The width of the rectangle is $x + 4$.
The length of the side of the square is $x + 2$.
All measurements are in centimetres.

The shaded shape in the diagram shows the metal remaining.

The area of the shaded shape is 20 cm^2.

a Show that $x^2 + 7x - 12 = 0$

(4)

b i Solve the equation $x^2 + 7x - 12 = 0$
Give your answers correct to 4 significant figures.

.....

(3)

ii Hence, find the perimeter of the square.
Give your answer correct to 3 significant figures.

..... cm

(1)

(Total 8 marks)

4 Bill said that the line $y = 6$ cuts the curve $x^2 + y^2 = 25$ at two points.

a By eliminating y show that Bill is incorrect.

(2)

b By eliminating y, find the solutions to the simultaneous equations

$$x^2 + y^2 = 25$$
$$y = 2x - 2$$

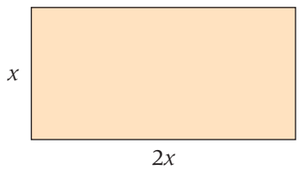
$x =$ ..... $y =$ .....

or $x =$ ..... $y =$ .....

(6)

(Total 8 marks)

5 The length of a rectangle is twice the width of the rectangle.
The length of a diagonal of the rectangle is 25 cm.



Work out the area of the rectangle.
Give your answer as an integer.

..... cm^2

(Total 3 marks)