Q1.
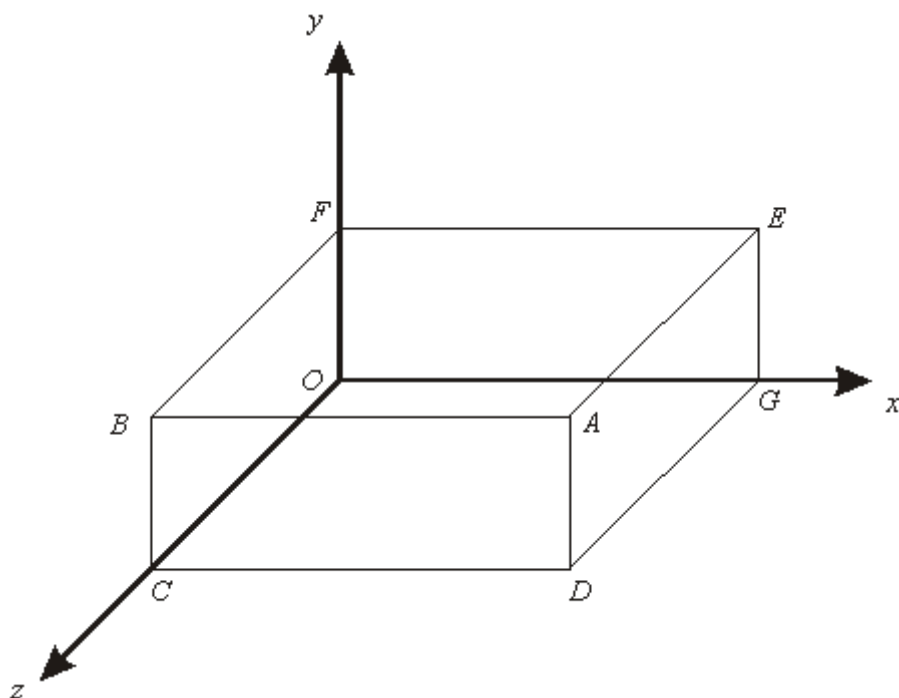

Diagram **NOT** accurately drawn

The diagram shows a cuboid drawn on a 3-D grid.

Vertex A has coordinates (5, 2, 3).

(a) Write down the coordinates of vertex E.

(............ , ... , ...)

(1)

B and D are vertices of the cuboid.

(b) Work out the coordinates of the midpoint of BD.

(............ , ... , ...)

(3)
(Total 4 marks)

Q2.

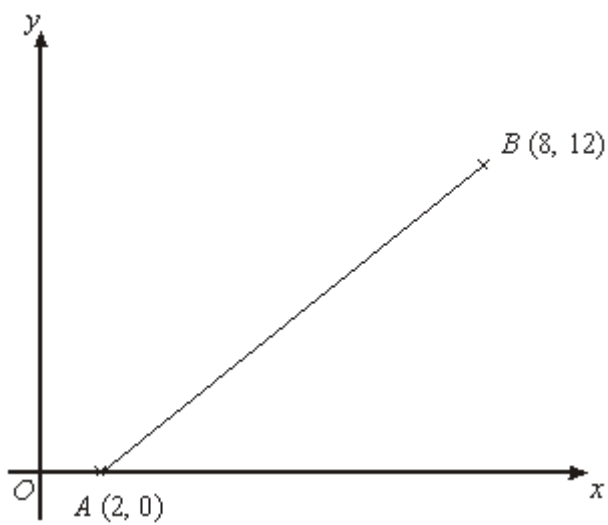

Diagram **NOT** accurately drawn

A is the point (2, 0).

B is the point (8, 12).

Work out the coordinates of the midpoint of AB.

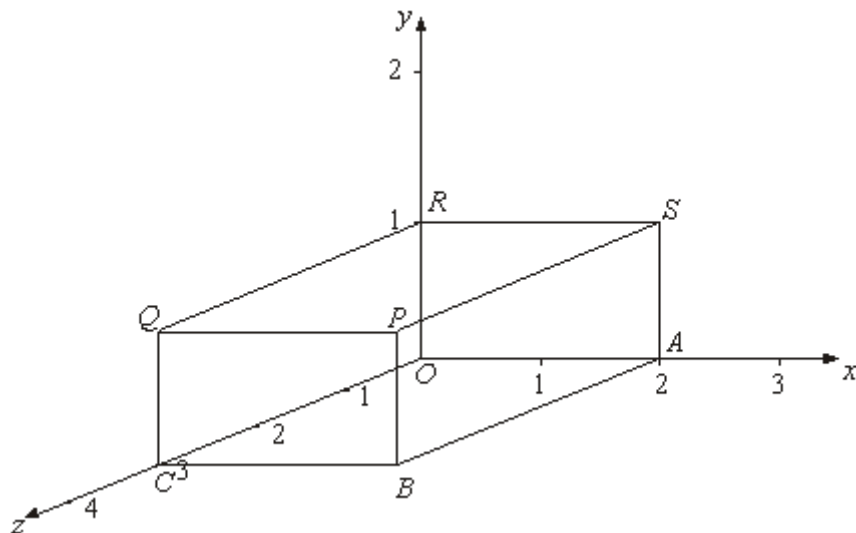(.............. , ...)

(Total 2 marks)

Q3.

Diagram **NOT** accurately drawn

A cuboid is shown on a 3-dimensional grid.

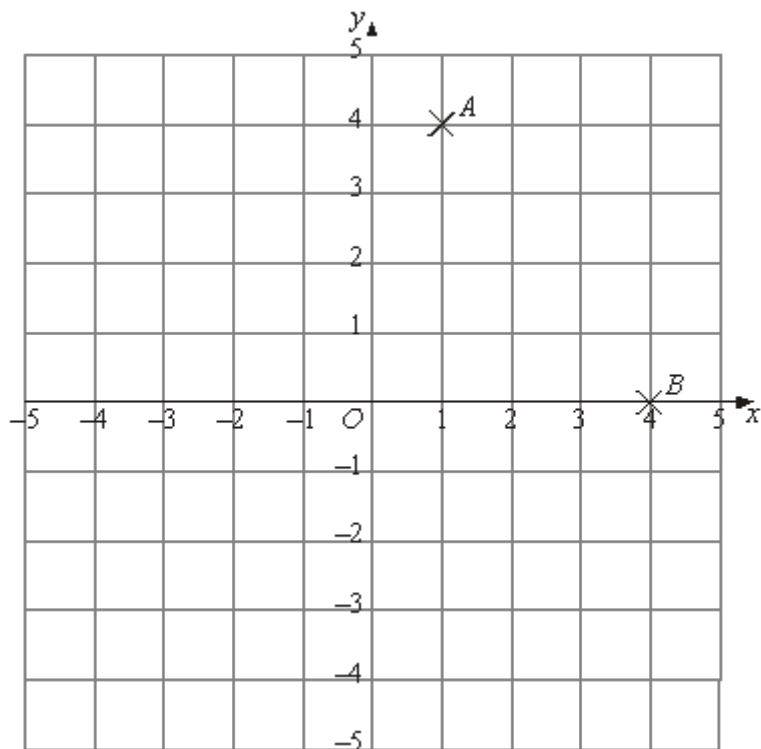(a)   Write down the letter of the point with coordinates (2, 1, 0).

....

(1)

(b)   Write down the coordinates of the point *P*.

(......... , ... , ...)

(1)
(Total 2 marks)

Q4.

(a) (i) Write down the coordinates of the point A.

(............. , ...)

(ii) Write down the coordinates of the point B.

(............. , ...)

(2)

(b) (i) On the grid, plot the point (3, 2).
Label this point P.

(ii) On the grid, plot the point (–4, 3).
Label this point Q.

(2)
(Total 4 marks)

Q5.
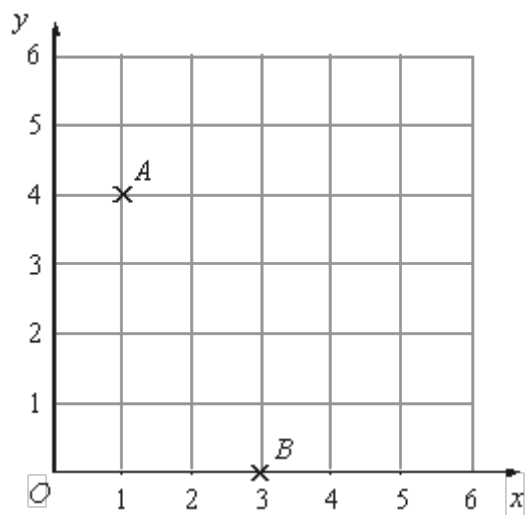
(a)   (i)   Write down the coordinates of point A.

(............ , ...)

(ii)   Write down the coordinates of point B.

(............ , ...)

(2)

(b)   On the grid, mark with a cross (✗) the point (5, 2).
Label this point C.

(1)
(Total 3 marks)

Q6.
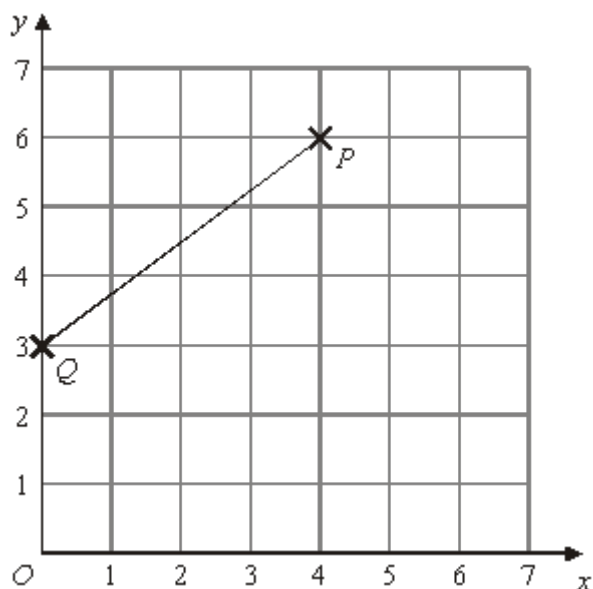
(a)   Write down the coordinates of the point *P*.

(.......... , ...)

(1)

(b)   Write down the coordinates of the point *Q*.

(.......... , ...)

(1)

M is the midpoint of the line from *Q* to *P*.

(c)   Find the coordinates of *M*.

(.......... , ...)

(2)
(Total 4 marks)

Q7.   Here is a coordinate grid.
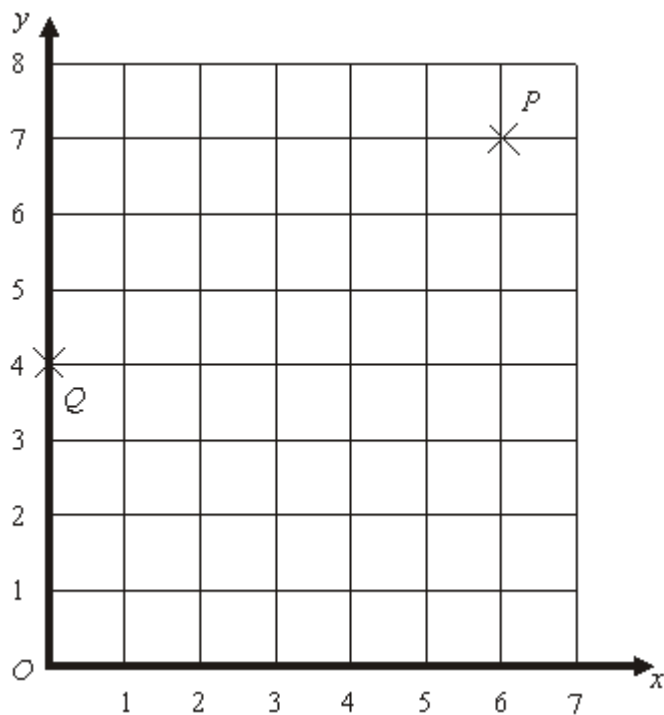
(a)   Write down the coordinates of the point P.

(......... , ...)

(1)

R is the midpoint of PQ.

(b)   Write down the coordinates of the point R.

(......... , ...)

(2)

The point B is on the x-axis.
The line BP is parallel to the y-axis.

(c)   Write down the coordinates of the point B.

(......... , ...)

(2)
(Total 5 marks)

M1.

	Working	Answer	Mark	Additional Guidance
(a)		(5, 2, 0)	1	**B1** for (5, 2, 0) cao
(b)	$\left(\dfrac{0+5}{2}, \dfrac{2+0}{2}, \dfrac{3+3}{2}\right)$	$\left(\dfrac{5}{2}, 1, 3\right)$	3	**B1** for (0, 2, 3) or for (5, 0, 3) or for (0, 0, 3) seen or implied **M1** for $\left(\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2}, \dfrac{z_1 + z_2}{2}\right)$ **A1** for $\left(\dfrac{5}{2}, 1, 3\right)$ oe **B1** SC for $(x, y, 3)$ ***Alternative mark scheme*** **B1** for each coordinate correct.
				Total for Question: 4 marks

M2.

Answer	Mark	Additional Guidance
(5, 6)	2	**B2** for (5, 6) oe **B1** for either (a, 6) or (5, b)
		Total for Question: 2 marks

M3.

	Answer	Mark	Additional Guidance
(a)	S	1	**B1** for S cao
(b)	(2, 1, 3)	1	**B1** for (2, 1, 3) cao
			Total for Question: 2 marks

M4.

	Answer	Mark	Additional Guidance
(a)(i)	(1, 4)	2	**B1** for (1, 4) cao
(ii)	(4, 0)		**B1** for (4, 0) cao
(b)(i)	P marked at (3, 2)	2	**B1** for P marked at (3, 2)
(ii)	Q marked at (–4, 3)		**B1** for Q marked at (–4,3)
			Total for Question: 4 marks

M5.

	Answer	Mark	Additional Guidance
(a)(i)	1, 4	2	**B1** cao
(ii)	3, 0		**B1** cao

(b)	C correct	1	**B1** cao

			Total for Question: 3 marks

M6.

	Working	Answer	Mark	Additional Guidance
(a)		(4, 6)	1	**B1** cao
(b)		(0, 3)	1	**B1** cao
(c)	$\left(\dfrac{0+4}{2}, \dfrac{3+6}{2}\right)$	(2, 4.5)	2	**B2** for (2, 4.5) ± 0.2 on each coordinate **[B1** for (2, b) b ≠ 4.5 or (a, 4.5) a ≠ 2 or (4.5, 2) or $\left(\dfrac{0+4}{2}, \dfrac{3+6}{2}\right)$ seen ±0.2 on each coordinate

			Total for Question: 4 marks

M7.

	Working	Answer	Mark	Additional Guidance
(a)		(6, 7)	1	**B1** cao
(b)		(3, 5.5)	2	**M1** Clear attempt to find the mean of either *x* or *y* coordinates of P and Q **A1** cao

				OR
				M1 identifies the midpoint of PQ on the diagram
				A1 cao
				SC B1 for exactly one coordinate correct
(c)		(6, 0)	2	**M1** for B correctly placed on the *x* axis
				A1 for (6, 0)
				Total for Question: 5 marks

OR

M1 identifies the midpoint of PQ on the diagram

E1.   Candidates realised what was required in this question but could not often carry out the execution of the task. In part (a) it was common to see a repetition of the coordinates of A whilst in (b) some candidates gained credit for realising that the z coordinate was in the same plane as *ABCD* and so gained a mark for using 3.

E2.   This question was not very well understood with the correct answer of (5, 6) rarely seen. The answer of (4, 6) was frequently seen, obtained from halving the coordinates of point B, these candidates gained 1 mark.

E3.   About three quarters of the candidates were able to gain at least one mark on this question. In part (a), a common incorrect answer for the point with coordinates (2, 1, 0) was *R*, and in part (b), a common incorrect answer for the coordinates of *P* was (2, 3, 1).

E4.   This question was answered well with most candidates gaining at least two of the four marks and many achieving full marks. Errors were seen most often in (a)(ii) where (0, 4) was the most common incorrect answer and in (b)(ii) where the most common error was to plot (3, –4) rather than (–4, 3).

E5.   A significant proportion of weaker candidates transposed the x and y co-ordinates in their answers to part (a) of this question. This error accounted for nearly all the incorrect responses. A similar error occurred in part (b) where candidates were required to plot a point. Instead of the point (5, 2) they plotted the point (2, 5). Some points were not labelled. The mark was awarded if the candidate's answer was unambiguous. Fully correct answers were seen for parts (a) and (b) in 80% and 91% of responses respectively.

E6.   Most candidates were able to correctly write down the coordinates of points *P* and *Q*, although a significant number reversed the coordinates to give (6, 4) and (3, 0) respectively. A significant number gave (1, 3) instead of (0, 3).

In part (c), the x-coordinate (2) was usually correct, but a y-coordinate of 4 or 5 was common. Some candidates reversed the coordinates to give (4.5, 2). This gained 1 mark only.