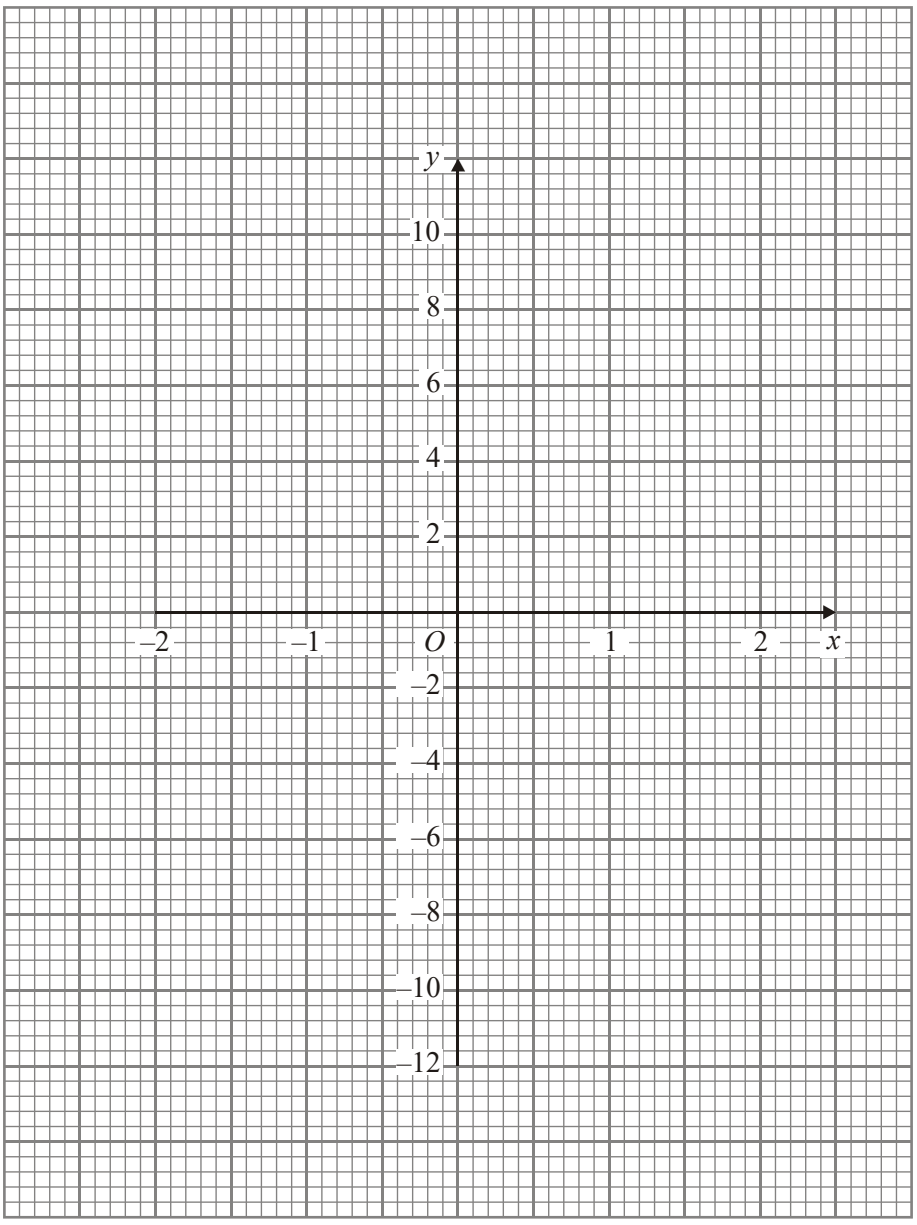
1. (a) Complete this table of values for $y = x^3 + x - 2$

x	–2	–1	0	1	2
y	–12			0	

(3)

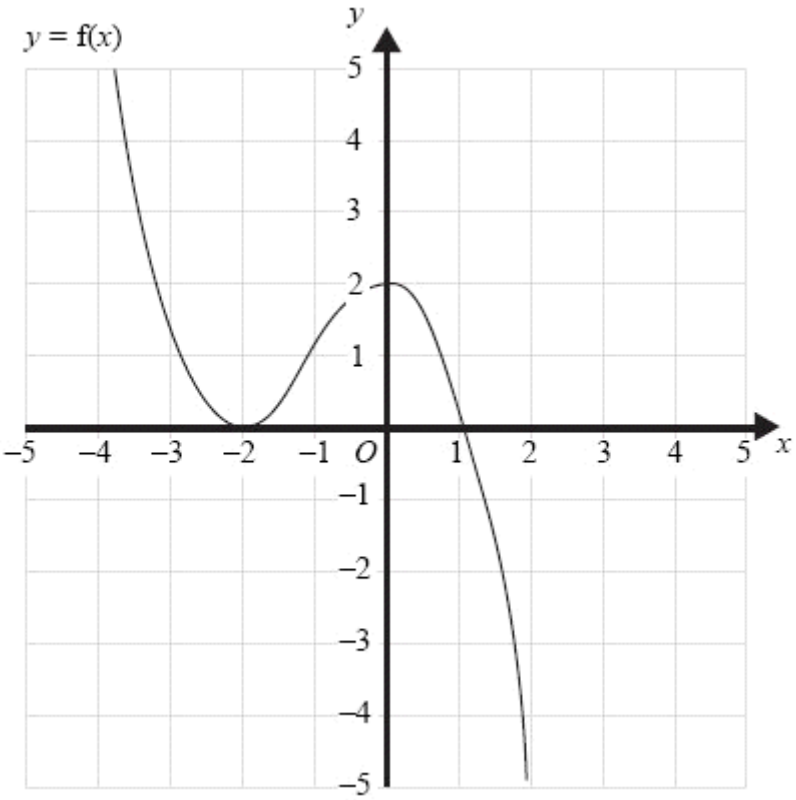
(b) On the grid, draw the graph of $y = x^3 + x - 2$



(2)
(Total 5 marks)

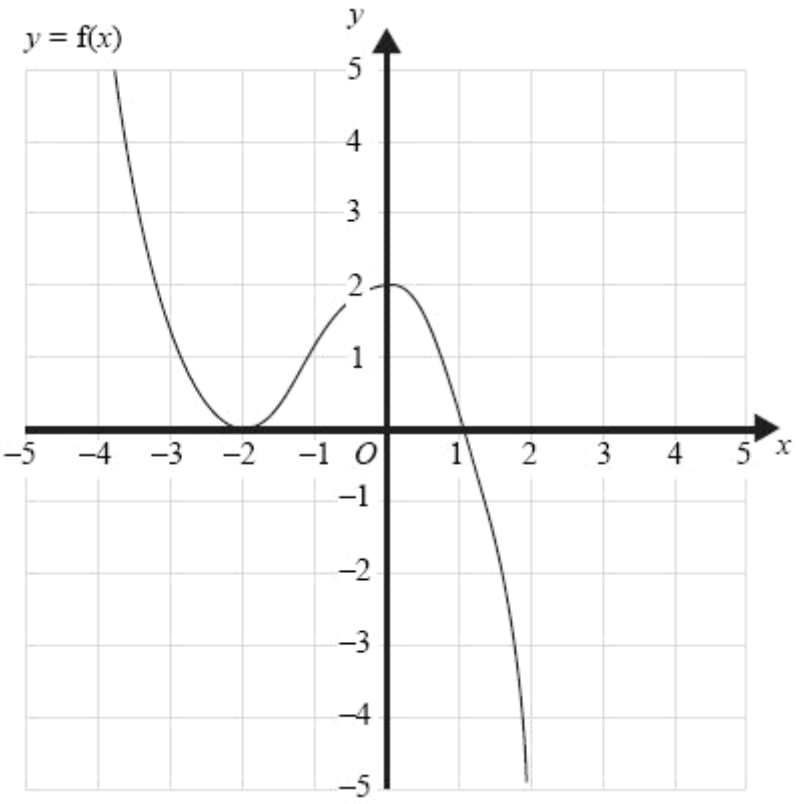
2. The graph of $y = f(x)$ is shown on the grids.

(a) On this grid, sketch the graph of $y = f(x - 1)$



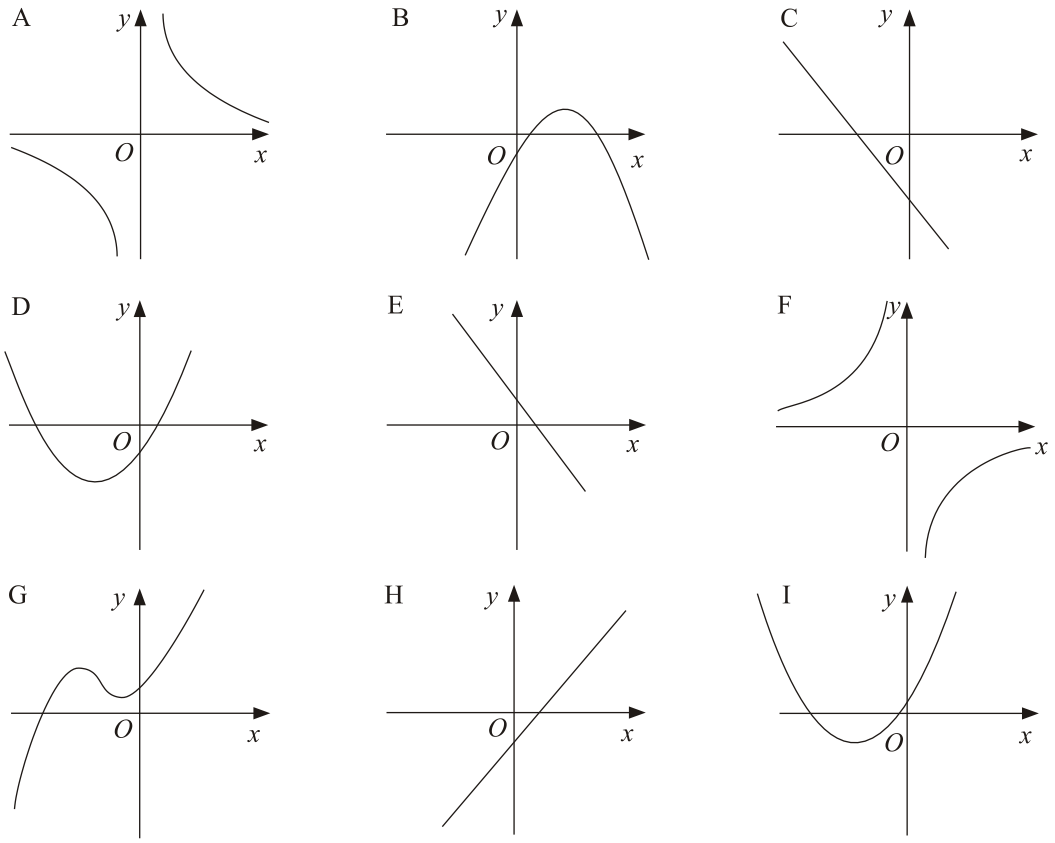
(2)

(b) On this grid, sketch the graph of $y = 2\,f(x)$



(2)
(Total 4 marks)

3.



Write down the letter of the graph which could have the equation

(i) $y = 1 - 3x$

.....

(ii) $y = \frac{1}{x}$

.....

(iii) $y = 2x^2 + 7x + 3$

.....

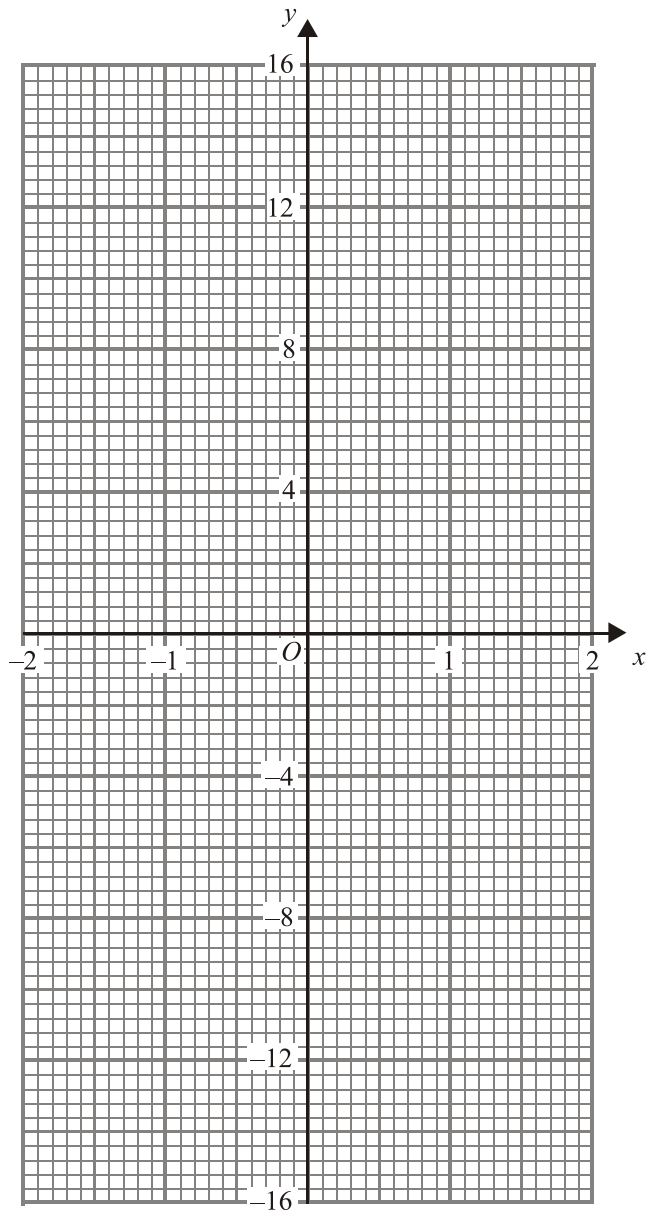
(Total 3 marks)

4. (a) Complete the table of values for $y = x^3 + 3x$

x	–2	–1	0	1	2	
y	–14		0			

(2)

(b) On the grid, draw the graph of $y = x^3 + 3x$



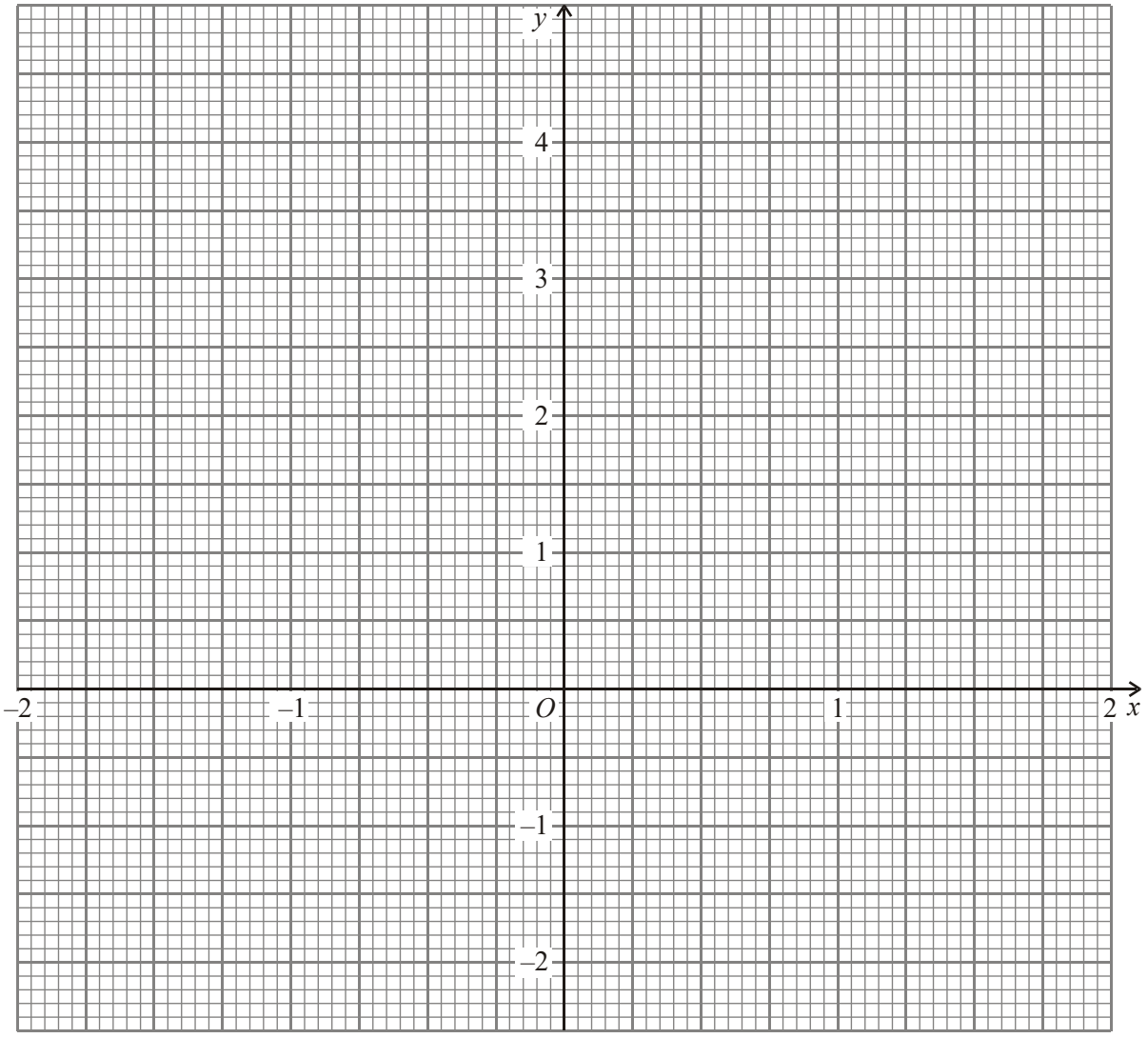
(2)
(Total 4 marks)

5. (a) Complete the table of values for $y = x^3 - 3x + 1$

x	–2	–1.5	–1	–0.5	0	0.5	1	1.5	2
y	–1		3	2.375	1	–0.375		–0.125	3

(1)

(b) On the grid, draw the graph of $y = x^3 - 3x + 1$ for $-2 \leq x \leq 2$



(2)
(Total 3 marks)

1. (a) (– 12) – 4 – 2 (0) 8 3

B3 for all correct [(B1 for each one correct)

(b) 5 points plotted accurately
points joined with smooth curve 2

B1 ± 1 full (2mm) square ft table if at least B1 awarded (all 5 points plotted)
B1 ft for any smooth curve if previous B1 gained
NB: curve must pass within 1 full square of the points

[5]

2. (a) Graph translated 1 unit to the right passing through the points (–1, 0), (1, 2) and (2, 0) 2

M1 for translation of $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$ *or* $\begin{pmatrix} -1 \\ 0 \end{pmatrix}$

A1 for right through the 3 points, $\pm \frac{1}{4}$ *sq*

(b) Graph stretched 2 units parallel to y-axis; passing through the points (–2, 0), (0, 4) and (1, 0) 2

M1 for graph stretched parallel to the y-axis by scale factor 2

A1 through all 3 points; $\pm \frac{1}{4}$ *sq not on grid at x = 2*

[4]

3. (i) E 3

B1 for E cao

(ii) A

B1 for A cao

(iii) I

B1 for I cao

[3]

4. (a) (–14) –4 (0) 4 14
–4, 4, 14 2

B2 for all 3 values correct
(B1 for 1 or 2 values correct)

(b) curve 2

B1 for all 5 points plotted correctly ± ½ square (ft from table if at least B1 awarded in (a))

B1 (indep) ft for any smooth curve through their points

[4]

5. (a) 2.125, –1 1

B1 for both values correct

(b) Points plotted, correct graph 2

B1 ft for at least 6 points correctly plotted ± ½ sq

B1 for smooth curve drawn through at least 8 correct points

[3]

1. Specification A

Higher Tier

Most candidates did well on this question scoring at least two marks in part (a) and one mark in part (b). Generally candidates were able to plot points accurately and draw a reasonably smooth curve through the points. The most common error in part (a) came from evaluating y at $x = 1$, which was usually worked out to be $y = 0$. Incorrect answers in part (b) were generally due to candidates joining up points with straight line segments rather than inaccuracies in fitting a curve to the points. The full range of marks was available to candidates in part (b) if numerical errors were present in part (a).

Intermediate Tier

This question proved to be a good discriminator. Many candidates gained full marks for the completion of the table, though the two negative values caused some difficulty for the minority of candidates. The main error by weaker candidates was to assume it was a linear sequence, and found values which then led to a straight line. This earned few marks, if any. Most of those who found some values then went on to plot them accurately. Many also recognised that a free-hand curve was needed to join the points; a minority either left the points unattached, or joined them incorrectly with straight line segments.

Specification B

A fully correct table of values was not the norm, correct substitution of $x = 0$ was more common than the correct substitution of $x = 2$ and then $x = –1$. Many candidates looked for a linear pattern and failed to score any marks at all in this question, usually –8, –4 and 4 filling the spaces in the table. When marks were scored in part (a) the majority of candidates followed through their table of values to score a mark for correct plotting. However a great number of candidates, having correctly plotted their points, either joined them up with line segments or failed to join them up at all. The latter showing a clear lack of practice in quadratic and cubic curve drawing.

2. **Specification A**

Many candidates understood that part (a) involved a translation. Many shifted the graph by –1 instead of +1 parallel to the x axis.
Part (b) was answered much less successfully. Many candidates did think that the transformation was some sort of stretch but were unable to demonstrate this sufficiently accurately. Commonly (0, 2) was mapped to (0,4), but (–2, 0) was mapped to (–2, –2). Some candidates dealt correctly with that part of the curve for x from –2 to +1, but then simply drew over the given curve for values of x outside that set.

Specification B

The correct graph was drawn by about one third of the candidates. The most common incorrect answer was to draw $y = f(x + 1)$. Candidates were much less successful in part (b) with less than 10% of candidates able to draw the correct graph. The common incorrect graph seen was $y = f(x) + 2$.

3. **Paper 5524**

This was a badly answered question. The majority of answers given by candidates were clearly guesses, and failed to show any relationship between the equations and the diagrams.

Paper 5526

This proved to be a challenging enough question with half of the candidate managing in each part to select the correct curve.
Candidates could usually pick out a straight line for the linear equation, but often picked the wrong diagram.

4. Both parts of this question were well answered. A few candidates did not realise the fact that cubic functions have graphs which are curves and not a set of straight line segments.

5. Many correct answers were seen in the table although 0.125 was often given instead of 2.125. It was common to see the point (1.5, –0.125) plotted at (1.5, –1.25). Although there were some who made no attempt to draw the graph, many clearly had a good idea of what was involved.