4 A particle P moves along the x-axis. At time t seconds ($t \geqslant 0$), the displacement of P from the origin is x metres and the velocity, v m/s, of P is given by $v = 2t^2 - 16t + 30$

(a) Find the times at which P is instantaneously at rest.

(2)

(b) Find the acceleration of P at each of these times.

(3)

When $t = 0$, P is at the point where $x = -4$

(c) Find the distance of P from the origin when P first comes to instantaneous rest.

(3)

Question 4 continued

(Total for Question 4 is 8 marks)

5 (a) Complete the table of values for $y = \dfrac{x^3 + 2}{x + 1}$ giving your answers to 2 decimal places where appropriate.

x	0	0.5	1	1.5	2	3	4
y		1.42		2.15		7.25	

(2)

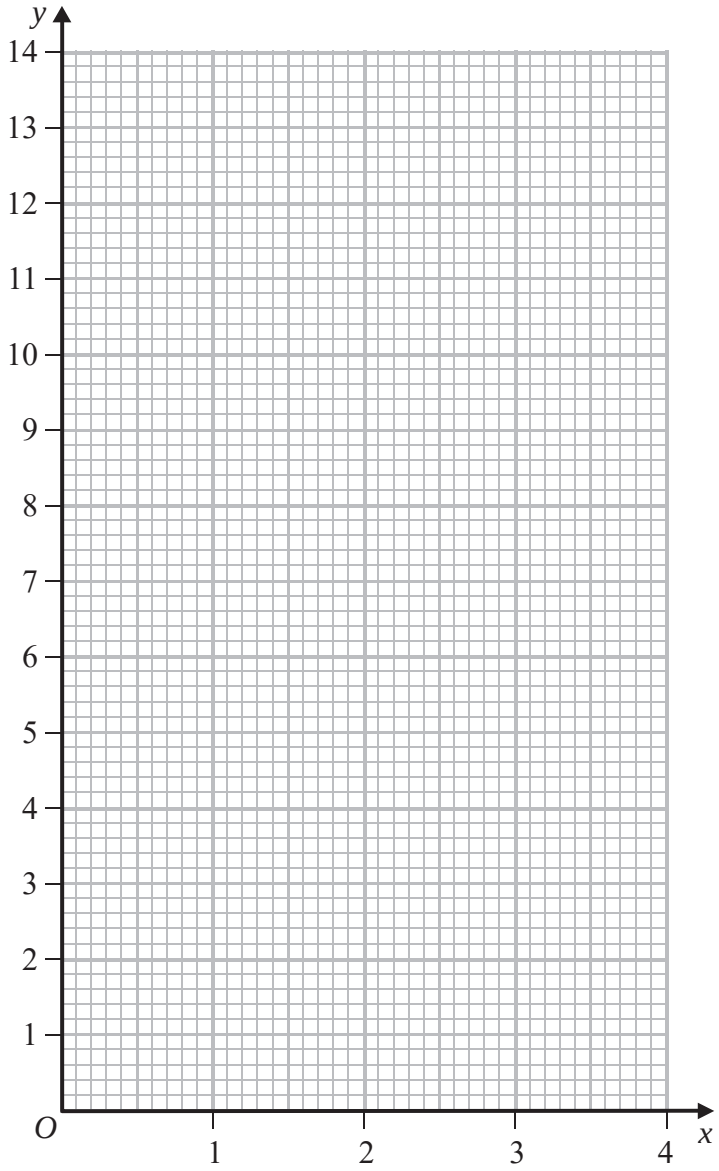
(b) On the grid opposite draw the graph of $y = \dfrac{x^3 + 2}{x + 1}$ for $0 \leqslant x \leqslant 4$

(2)

(c) By drawing a suitable straight line on your graph obtain an estimate, to 1 decimal place, of the root of the equation $x^3 + x^2 - 3x - 2 = 0$ in the interval $0 \leqslant x \leqslant 4$

(5)

Question 5 continued

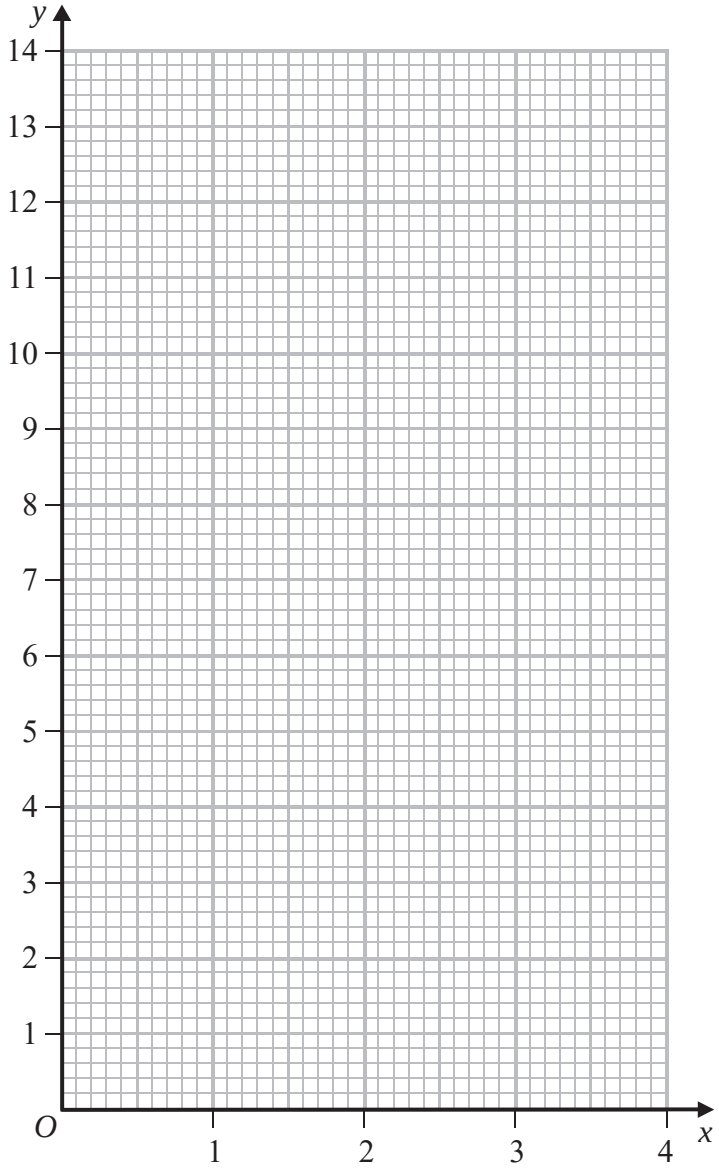


Turn over for a spare grid if you need to redraw your graph

Question 5 continued

Question 5 continued

Only use this grid if you need to redraw your graph



(Total for Question 5 is 9 marks)