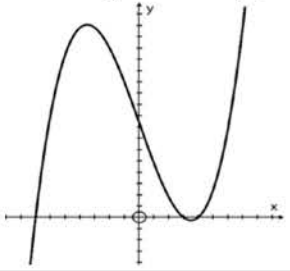
7	(a)		**DR** Nigel should substitute $x=-7$ not $x=7$; his calculation shows that $(x-7)$ is not a factor $(-7)^3-37\times(-7)+84=-343+259+84=0$, so $(x+7)$ is a factor	**B1** **B1** **[2]**	**2.3** **2.1**	Any suitable comment that references the factor theorem Clear argument needed	Allow for correct algebraic division if comment made about no remainder.
7	(b)		**DR** $x^3-37x+84=(x+7)(x^2-7x+12)$ $=(x+7)(x-3)(x-4)$ Crosses x-axis at (–7, 0), (3, 0), (4, 0) Crosses y-axis at (0, 84) 	**M1** **M1** **A1** **(dep)** **B1** **B1** **[5]**	**3.1a** **1.1a** **1.1** **1.1** **1.1**	Attempt to divide cubic by $(x+7)$ or find a quadratic factor by inspection Attempt to factorise their quadratic factor oe and find points on x-axis FT Accept values shown on sketch graph www Accept value shown on sketch graph www Axes labelled and correct general shape FT their values as long as right way up.	May be seen above (Allow if at least two correct terms) The A mark is dependent on the second M mark Exact position of the stationary points is not needed

7	(c)		**DR**					
			Equation of the form $y=(x-1)^3-37(x-1)+84$	**M1**	**3.1a**	Substituting $(x-1)$ for x twice		
			$=(x^3-3x^2+3x-1)-37(x-1)+84$	**M1**	**1.1a**	Attempt to expand		
				A1	**1.1**	Correct expansion of their cubic term		
			$y=x^3-3x^2-34x+120$	**A1**	**1.1**	cao (including $y=$)		
				[4]				
			Alternative solution					
			Equation of the form $y=(x-1+7)(x-1-3)(x-1-4)$	**M1**		Substituting $(x-1)$ for x everywhere	Allow for $(x+6)(x-4)(x-5)$	
			$=(x+6)(x^2-9x+20)$ or $(x-4)(x^2+x-30)$ or $(x-5)(x^2+2x-24)$	**M1** **A1**		Attempt to multiply out their factors Correct quadratic factor		
			$y=x^3-3x^2-34x+120$	**A1**		cao (including $y=$)		
				[4]				