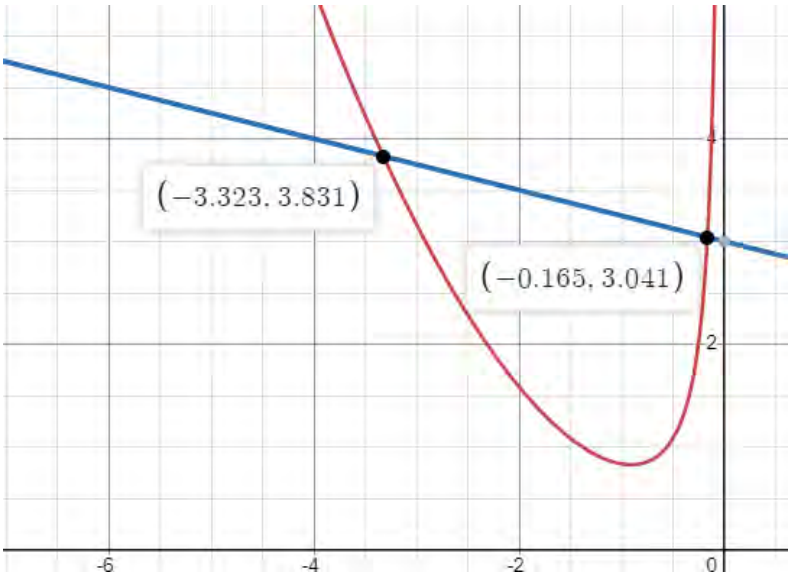


Question	Scheme	Marks
4	$4x^3 + 3x^2 - 36x - 6 = 0 \rightarrow \div 12x$ $\Rightarrow \frac{x^2}{3} + \frac{x}{4} - 3 - \frac{1}{2x} = 0 \Rightarrow \frac{x^2}{3} - \frac{1}{2x} = 3 - \frac{x}{4}$ ALT $\frac{x^2}{3} - \frac{1}{2x} = ax + b \Rightarrow 2x^3 - 6ax - 6bx - 3 = 0$ $\Rightarrow 4x^3 - 12ax - 12bx - 6 = 4x^3 + 3x - 36x - 6$ $\Rightarrow a = -\frac{1}{4} \quad b = 3$ \Rightarrow line required is $y = 3 - \frac{x}{4}$ Draws the line with equation $y = 3 - \frac{x}{4}$ $x = -0.2 \quad x = -3.3$ or -3.4	M1A1 [M1 A1] M1 A1 [4]
Total 4 marks		

Mark	Notes
Note	<ul style="list-style-type: none">• Correct values without any evidence of valid working or a line is M0A0M0A0• Correct values with a correct line drawn without valid working is M0A0M0A0• Correct values with a line drawn and the correct equation of a line without evidence of any valid working is SC M0A0M1A0
M1	<p>For dividing through by $12x$ [you may well see this in stages – e.g., first by 4, then by 3, then by x etc] and attempting to rearrange the equation to give as a minimum</p> $y = k \pm \frac{x}{4} \quad \text{or} \quad y = 3 \pm \frac{x}{m} \quad 2 \leq m \leq 6$ <p>OR</p> <p>Sets the given equation of the curve $= ax + b$ and solves for a and b to find as a minimum</p> <p>to give as a minimum $y = k \pm \frac{x}{4} \quad \text{or} \quad y = 3 \pm \frac{x}{m} \quad 2 \leq m \leq 6$</p>
A1	For the correct straight line.
M1	<p>Draws their line correctly on the grid. Look for $(0, 3)$ and $(-4, 4)$ provided it is of the form $y = k \pm \frac{x}{4}$</p> <p>You MUST see the equation of the line WITH the drawn line. A correct line without an equation is M0</p> 
A1	<p>For both $x = -0.2$ and $x = -3.3$</p> <p>Answers must be given to 1 dp only [2 or more dp is A0]</p> <p>NB: Calculator values are -0.165, -3.323</p>