Question		Answer	Marks	AO	Guidance
4		**DR**			For reference: $y = 2x^3 - 6x^2 + 4x - \frac{8}{x}$ at the point $(2, -4)$.
		$\left(\frac{dy}{dx} =\right) 6x^2 - 12x + 4 + \frac{8}{x^2}$	**M1**	**1.1**	Four term expression with the powers reduced by 1 in at least 3 terms with either the term in x or x^2 correct.
		At $x = 2, \frac{dy}{dx} = 6$	**A1**	**1.1**	Correct value of the derivative at $x = 2$ – **must** follow from correct derivative but explicit substitution is not required. Therefore, the correct value seen only (possibly from BC) is **M0 A0** (as question requires **DR**) and similarly **A0FT** (for the next mark).
		$m_N = -\frac{1}{6}$	**A1FT**	**2.2a**	Correct use of $m_T m_N = -1$ with their numerical value of y' (from using $x = 2$) soi.
		$y + 4 = -\frac{1}{6}(x - 2)$	**M1**	**1.1**	Correct use of $y - (-4) = m_N(x - 2)$ with their numerical m_N (so must come from use of $m_T m_N = -1$). Or using $y = m_N x + c$ with $x = 2, y = -4$ together with their m_N **and** solving to find c (which if correct is $-\frac{11}{3}$).
		$x + 6y + 22 = 0$	**A1**	**2.1**	cao – all previous marks **must** have been awarded. Must be of the form $ax + by + c = 0$ with a, b and c integers (so allow any integer multiple of answer in Answer column e.g. $-2x - 12y - 44 = 0$ or $22 + x + 6y = 0$) but **must** see $= 0$.
			[5]		