Question Number	Answer		Mark
12(a)	**Either** Resistance at 54°C = 0.95 - 1.0 (kΩ) Use of resistors in parallel formula Use of $V = IR$ Milliammeter reading = 9.0 (mA) (MP2 can only be awarded if the thermistor resistance is added to 3.0 kΩ prior to using the formula). **Or** Resistance at 54°C = 0.95 - 1.0 (kΩ) Use of $V = IR$ to calculate current in 2.0 kΩ resistor Use of resistors in series formula and $V = IR$ Milliammeter reading = 9.0 (mA) <u>Example of calculation</u> At 54°C, resistance of thermistor (read from graph) = 1.0 kΩ. $\frac{1}{R_T} = \frac{1}{2000\ \Omega} + \frac{1}{(3000+1000)\Omega}$, so $R_T = 1333\ \Omega$ $I = \frac{V}{R} = \frac{12\ \text{V}}{1333\ \Omega} = 9.0\ \text{mA}$	 (1) (1) (1) (1) (1) (1) (1) (1)	4
12(b(i)	Resistance (of thermistor) increases (Thermistor takes a larger share of the pd) so voltmeter reading increases (MP2 dependent on MP1 being awarded)	(1) (1)	2
12(b)(ii)	**Either** Potential difference (across 2.0 kΩ resistor) is constant Power dissipated (by 2.0 kΩ resistor) remains the same because $P = V^2/R$ **Or** Current (in 2.0 kΩ resistor) is constant Power dissipated (by 2.0 kΩ resistor) remains the same because $P = I^2R$ **Or** Potential difference and current (for 2.0 kΩ resistor) are both constant Power dissipated (by 2.0 kΩ resistor) remains the same because $P = VI$	 (1) (1) (1) (1) (1) (1)	2
	Total for question 12		**8**