

## DATA ANALYSIS TASK – Mark Scheme

Question	Marking details	Marks Available																											
(a)	<table border="1" data-bbox="371 439 1145 920"> <thead> <tr> <th>Temperature, <math>\theta</math> /<math>^{\circ}\text{C}</math></th><th>Mean resistance, <math>R_{\theta}/\Omega</math></th><th>Absolute uncertainty /<math>\Omega</math></th></tr> </thead> <tbody> <tr><td><math>10 \pm 1</math></td><td>4.97</td><td>0.08</td></tr> <tr><td><math>20 \pm 1</math></td><td>5.18</td><td>0.06</td></tr> <tr><td><math>30 \pm 1</math></td><td>5.30</td><td>0.04</td></tr> <tr><td><math>40 \pm 1</math></td><td>5.50*</td><td>0.10*</td></tr> <tr><td><math>50 \pm 1</math></td><td>5.71</td><td>0.09</td></tr> <tr><td><math>60 \pm 1</math></td><td>5.90*</td><td>0.10*</td></tr> <tr><td><math>70 \pm 1</math></td><td>6.05</td><td>0.08</td></tr> <tr><td><math>80 \pm 1</math></td><td>6.25</td><td>0.06</td></tr> </tbody> </table> <p style="text-align: center;">(1)                      (1)</p> <p>1 mark for each correct column. Note all numbers must be identical to those given in the table including any zeros - *but accept <math>5.5 \pm 0.1</math> and <math>5.9 \pm 0.1</math>.</p>	Temperature, $\theta$ / $^{\circ}\text{C}$	Mean resistance, $R_{\theta}/\Omega$	Absolute uncertainty / $\Omega$	$10 \pm 1$	4.97	0.08	$20 \pm 1$	5.18	0.06	$30 \pm 1$	5.30	0.04	$40 \pm 1$	5.50*	0.10*	$50 \pm 1$	5.71	0.09	$60 \pm 1$	5.90*	0.10*	$70 \pm 1$	6.05	0.08	$80 \pm 1$	6.25	0.06	2
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(b)	<p>Axes labelled with units and suitable scales (not involving awkward factors, e.g. 3 / over <math>\frac{1}{2}</math> each axis used). (1) All points plotted correctly to within <math>\frac{1}{2}</math> small square division. (2) (–1 for each incorrect plot). All error bars plotted correctly. (1) Correct maximum gradient and minimum gradient lines consistent with the error bars. (1) See exemplification on pages 4-8 for additional guidance on marking this section.</p>	5																											
(c)	<p>It is a straight-line graph. (1) <b>Positive</b> intercept (on the resistance axis). (1) For the 3<sup>rd</sup> mark: <b>Either:</b> Possible to draw a straight line through all the error bars / boxes. (1) Accept data points <b>Or</b> Has a positive gradient. (1)</p> <p>N.B. There is no mark for just “yes it is in agreement”. <b>Subtract one mark</b> for contradictory conclusion e.g. “not in agreement” because a straight line with positive intercept through all error bars → 2 marks</p>	3																											