

## Chapter 0 Toolkit. Revision Questions page 29-31. Multiple Choice Answers

Q	Ans	Explanation
1	B	The only option which is about making a judgement is B as it commands you to interpret the evidence and come to a conclusion. Options A and D are about analysis of experimental evidence by identification of trends, patterns and relationships. Option C is about conclusions but it is about the research process not the evidence.
2	A	The gradient is the $m$ value in the linear equation $y = mx + c$ . The $m$ value for the maximum gradient is 12.0 and the $m$ value for the minimum gradient is 6.0. The general formula for uncertainty is $\delta x = \pm \frac{x_{\max} - x_{\min}}{2}$ which, for the gradient $m$ becomes $\delta m = \pm \frac{m_{\max} - m_{\min}}{2} = \pm \frac{12.0 - 6.0}{2}.$
3	A	An error bar shows the range of data for the y-variable data points (usually the dependent variable) and is not in percentage terms, nor is it anything to do with the gradient or accuracy.
4	C	A is an extension as the range of data didn't extend far enough; B is a redirection as there is a change in the variables being measured; C is a refinement as the original experiment wasn't accurate enough; D is a redirection as there is an unaccounted-for variable that needs to be addressed.
5	A	Repeated measurements will give an average value closer to the best estimate of the true value as random errors will sometimes give a high reading and sometimes a low reading but over a large enough set these will cancel out. Systematic error is not affected by repeated measurements as the value will always be too high or too low. It will have no effect on accuracy as that is affected by the quality of the method and the measuring device. Replicates will affect precision but will make the result more precise rather than decreasing the precision.
6	B	The sequence is: claim, overview of evidence, research question which together makes up the rationale.
7	C	Only the data and formula book is provided in advance. The stimulus will form part of the introduction to the questions and will be given with the question itself. All the others are true.
8	B	The shape indicates an inverse relationship where as $x$ gets bigger $y$ gets smaller. However, we don't know if it is $y \propto 1/x$ or $y \propto 1/x^2$ . However, only one of these appears in the options so we choose B.
9	A	The gradient is calculated by change in $y$ divided by change in $x$ . For the whole line, $y$ changes from 16 to 50 which equals a change of +34, and $x$ changes from 0 to 20, a change of +20. The $m$ value (the gradient) is thus $34/20 = 1.7$ . The $c$ -value is the intercept on the $y$ -axis when $x = 0$ . This occurs at a value of +16. Hence $y = 1.7x + 16$ .
10	C	When values in a number are transposed it is just an incorrect value caused by a mistake. It is not an outlier as that would be a genuine data point that seems too large or too small compared to what it is expected to be

Downloaded from [seniorphysics.com/ncpq](http://seniorphysics.com/ncpq).