B2	Answers to the Calculator Paper	
1	Mark 1 Know how to find a percentage decrease $\qquad$ $100 - 12 = 88\% = 0.88$	
	Mark 2 Use this answer to find value over three years $\qquad$ $177000 \times 0.88^3 \; or \; \left(\frac{88}{100}\right)^3$	
	Mark 3 Calculate the answer $\qquad$ £120620.544	
	Mark 4 Rounding $\qquad$ **£120621**	
	Full marks will be given for finding percentage decrease each year for 3 years. $\quad Year \; 1 \;\; £176500 \times 0.88 = 155760. \;\; Year \; 2 \;\; £137068.80. \;\; Year \; 3 \;\; £120621$	
	3 marks will be given for a percentage increase $\;\; 177000 \times 1.12^3 = £248672$	
	No marks will be given for taking away 3 lots of 12% $\rightarrow 177000 - 3 \times 21240 = £113280$	
2	Mark 1 Substitute into the formula $\qquad$ $V_{cone} = \frac{1}{3} \times \pi \times (370)^2 \times 410$	
	Mark 2 Calculate the answer $\qquad$ $V_{cone} = 58778151.35$	
	Mark 3 Round to 2 sig figs $\qquad$ $V_{cone} = 59000000$	
	Mark 4 Answer in scientific notation with units $\qquad$ $\boldsymbol{V_{cone} = 5.9 \times 10^7 m^3}$	
	3 marks are available for an answer of $\boldsymbol{5.877 \ldots \times 10^7 m^3}$	
3	Mark 1 Substitute into the area formula $\qquad$ $Area = \frac{1}{2} \times 20 \times 16 \times \sin 80$	
	Mark 2 Calculate area $\qquad$ $\boldsymbol{Area = 157.6 \; cm^2}$	
4	Mark 1 Find the gradient between two point $\qquad$ $m = \frac{4--3}{20-6} = \frac{7}{14}$	
	Mark 2 Substitute gradient and one point into the equation of the straight line. $\qquad -3 = \frac{1}{2} \times 6 + c \; or \; y + 3 = \frac{1}{2}(x-6)$ etc	
	Mark 3 Find c and state the equation in the simplest form $\qquad c = -6, \;\; \boldsymbol{y = \frac{1}{2}x - 6}$	
	Mark 4 Use this equation to find the calories $\;\; C = 10(30) + 220 = \boldsymbol{520}$	

5	Mark 1	Long side squared	$c^2 = 19.7^2 = 388.09$	
	Mark 2	Sum of short sides squared	$a^2 + b^2 = 13.2^2 + 14.6^2 = 387.4$	
	Mark 3	Conclusion	**"As $388.09 \neq 387.4$ then $c^2 \neq a^2 + b^2$ and so by the converse of Pythagoras this is not a right-angled triangle"**	

Your final answer must contain a comparison.
If you have the unrounded values for mark 1 and mark 2, but round these to 388 to show this this a right-angled triangle. Then you have lost the last mark.

You can get full marks using:
1. long side or short side Pythagoras $\sqrt{13.2^2 + 14.6^2} = 19.6824..$ or $\sqrt{19.7^2 - 13.2^2} = 14.6236$ as long as you don't round and your conclusion contains a $\neq$
2. Cosine Rule for angle D, $\cos D = \frac{13.2^2 + 14.6^2 - 19.7^2}{2 \times 13.2 \times 14.6}$, D = 90.1025°. Remember not to round this to 90° and falsely state that this is a R.A.T.

6	Mark 1	Use bearings to find angle ABC	$\angle ABC = 180° - 150° = 30°$	
	Mark 2	Find the third angle BCA	$\angle BCA = 85°$	
	Mark 3	Sine Rule	$\frac{30}{\sin 85} = \frac{BC}{\sin 65}$	
	Mark 4	Answer	$BC = \frac{30 \times \sin 65}{\sin 85} = \textbf{27.3 } \textbf{\textit{km}}$	

7	Mark 1	Form equation	$5 = \tan x$	
	Mark 2	Find the first angle	$x = 76.7°$	
	Mark 3	Find the second angle	$x = 258.7°$	
	Mark 4	Give your answer in coordinate form	$\textbf{\textit{P}}(\textbf{76.7°, 5}), \ \textbf{\textit{Q}}(\textbf{258.7°, 5})$	

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	Mark 1	Replace $\tan x$	$\frac{\cos x\left(\frac{\sin x}{\cos x}\right)}{\sin x}$	
	Mark 2	Simplify	$\frac{\cos x \sin x}{\sin x \cos x} = \frac{\cos x \sin x}{\cos x \sin x} = \textbf{1}$	

9	Mark 1	Find angle AOB	$\angle AOB = 150°$	
	Mark 2	Substitute into the formula for arc length	$120 = \frac{150}{360} \times \pi \times D$	
	Mark 3	Rearrange to find the diameter (or the radius)	$\frac{120 \times 360}{150\pi} = D \ (= 91.67)$	
	Mark 4	Calculate the length of the radius	radius is $\textbf{45.8 } \textbf{\textit{cm}}$	