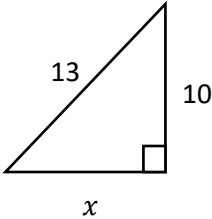


A2	Answers to the Calculator Paper																																																
1	<p>Mark 1 Know how to find a percentage increase</p> <p>Mark 2 Use this answer to find value over three years</p> <p>Mark 3 Give the unrounded answer</p> <p>Mark 4 round answer to the nearest pound</p> <p>Full marks will be given for finding percentage increase each year for 3 years. Year 1 £28400 × 1.023 = 29053.20 Year 2 £29721.4236. Year 3 £30405.01634 = £30405</p> <p>2 marks will be given for a percentage decrease 28400 × 0.977³ = 26485 No marks will be given for adding 3 lots of 2.3% → 28400 + 3 × 653.2 = £30360</p>	<p>100 + 2.3 = 102.3% = 1.023</p> <p>28400 × 1.023³ or $\left(\frac{102.3}{100}\right)^3$</p> <p>£30405.01634</p> <p>£30405</p>																																															
2	<p>Mark 1 Find the mean $\bar{x} = \frac{49}{7} = 7$</p> <p>Mark 2 Complete the table of values for either formula</p> <table><tr><td><table><tr><td>x</td><td>$x - \bar{x}$</td><td>$(x - \bar{x})^2$</td></tr><tr><td>13</td><td>6</td><td>36</td></tr><tr><td>7</td><td>0</td><td>0</td></tr><tr><td>0</td><td>-7</td><td>49</td></tr><tr><td>9</td><td>2</td><td>4</td></tr><tr><td>7</td><td>0</td><td>0</td></tr><tr><td>8</td><td>1</td><td>1</td></tr><tr><td>5</td><td>-2</td><td>4</td></tr><tr><td>$\sum x = 49$</td><td>$\sum (x - \bar{x}) = 0$</td><td>$\sum (x - \bar{x})^2 = 94$</td></tr></table></td><td><table><tr><td>x</td><td>x^2</td></tr><tr><td>13</td><td>169</td></tr><tr><td>7</td><td>49</td></tr><tr><td>0</td><td>0</td></tr><tr><td>9</td><td>81</td></tr><tr><td>7</td><td>49</td></tr><tr><td>8</td><td>64</td></tr><tr><td>5</td><td>25</td></tr><tr><td>$\sum x = 49$</td><td>$\sum x^2 = 437$</td></tr></table></td></tr></table> <p>Mark 3 Substitute into the correct formulae $s = \sqrt{\frac{94}{7-1}}$ $s = \sqrt{\frac{437 - \frac{49^2}{7}}{7-1}}$</p> <p>Mark 4 Calculate the standard deviation s = 3.958</p> <p>Mark 5 Compare the mean - (16 > 7). On average more points were scored under the new coach.</p> <p>Mark 6 Compare the standard deviation - (3.25 < 3.958). With the new coach the points scored in the matches were more consistent or (less varied)</p>	<table><tr><td>x</td><td>$x - \bar{x}$</td><td>$(x - \bar{x})^2$</td></tr><tr><td>13</td><td>6</td><td>36</td></tr><tr><td>7</td><td>0</td><td>0</td></tr><tr><td>0</td><td>-7</td><td>49</td></tr><tr><td>9</td><td>2</td><td>4</td></tr><tr><td>7</td><td>0</td><td>0</td></tr><tr><td>8</td><td>1</td><td>1</td></tr><tr><td>5</td><td>-2</td><td>4</td></tr><tr><td>$\sum x = 49$</td><td>$\sum (x - \bar{x}) = 0$</td><td>$\sum (x - \bar{x})^2 = 94$</td></tr></table>	x	$x - \bar{x}$	$(x - \bar{x})^2$	13	6	36	7	0	0	0	-7	49	9	2	4	7	0	0	8	1	1	5	-2	4	$\sum x = 49$	$\sum (x - \bar{x}) = 0$	$\sum (x - \bar{x})^2 = 94$	<table><tr><td>x</td><td>x^2</td></tr><tr><td>13</td><td>169</td></tr><tr><td>7</td><td>49</td></tr><tr><td>0</td><td>0</td></tr><tr><td>9</td><td>81</td></tr><tr><td>7</td><td>49</td></tr><tr><td>8</td><td>64</td></tr><tr><td>5</td><td>25</td></tr><tr><td>$\sum x = 49$</td><td>$\sum x^2 = 437$</td></tr></table>	x	x^2	13	169	7	49	0	0	9	81	7	49	8	64	5	25	$\sum x = 49$	$\sum x^2 = 437$	
<table><tr><td>x</td><td>$x - \bar{x}$</td><td>$(x - \bar{x})^2$</td></tr><tr><td>13</td><td>6</td><td>36</td></tr><tr><td>7</td><td>0</td><td>0</td></tr><tr><td>0</td><td>-7</td><td>49</td></tr><tr><td>9</td><td>2</td><td>4</td></tr><tr><td>7</td><td>0</td><td>0</td></tr><tr><td>8</td><td>1</td><td>1</td></tr><tr><td>5</td><td>-2</td><td>4</td></tr><tr><td>$\sum x = 49$</td><td>$\sum (x - \bar{x}) = 0$</td><td>$\sum (x - \bar{x})^2 = 94$</td></tr></table>	x	$x - \bar{x}$	$(x - \bar{x})^2$	13	6	36	7	0	0	0	-7	49	9	2	4	7	0	0	8	1	1	5	-2	4	$\sum x = 49$	$\sum (x - \bar{x}) = 0$	$\sum (x - \bar{x})^2 = 94$	<table><tr><td>x</td><td>x^2</td></tr><tr><td>13</td><td>169</td></tr><tr><td>7</td><td>49</td></tr><tr><td>0</td><td>0</td></tr><tr><td>9</td><td>81</td></tr><tr><td>7</td><td>49</td></tr><tr><td>8</td><td>64</td></tr><tr><td>5</td><td>25</td></tr><tr><td>$\sum x = 49$</td><td>$\sum x^2 = 437$</td></tr></table>	x	x^2	13	169	7	49	0	0	9	81	7	49	8	64	5	25	$\sum x = 49$	$\sum x^2 = 437$			
x	$x - \bar{x}$	$(x - \bar{x})^2$																																															
13	6	36																																															
7	0	0																																															
0	-7	49																																															
9	2	4																																															
7	0	0																																															
8	1	1																																															
5	-2	4																																															
$\sum x = 49$	$\sum (x - \bar{x}) = 0$	$\sum (x - \bar{x})^2 = 94$																																															
x	x^2																																																
13	169																																																
7	49																																																
0	0																																																
9	81																																																
7	49																																																
8	64																																																
5	25																																																
$\sum x = 49$	$\sum x^2 = 437$																																																
3	<p>Use the cosine rule for this triangle</p> <p>Mark 1 Substitute into the cosine rule</p> <p>Mark 2 Calculate the exact value</p> <p>Mark 3 Calculate angle BPM</p> <p>2 marks are given for finding angle PMB = 57.8° or angle PBM = 53.5°</p>		<p>$Angle\ BPM = \frac{1000^2 + 950^2 - 1100^2}{2 \times 1000 \times 950}$</p> <p>$Angle\ BPM = \frac{277}{790} = 0.36447368 \dots$</p> <p>$EDF = \cos^{-1}\left(\frac{277}{790}\right) = 68.6^\circ$</p>																																														

4	<p>Mark 1 subtract c</p> <p>Mark 2 divide by a</p> <p>Mark 3 square root</p> <p>No marks will be given for the correct answer without working.</p>	$r - c = ax^2$ $\frac{r-c}{a} = x^2$ $x = \sqrt{\frac{r-c}{a}}$	
5	<p>Mark 1 rearrange equation</p> <p>Mark 2 calculate value for x</p> <p>Mark 3 calculate a second value for x</p> <p>2 marks will be given for $\sin x = \frac{4}{5}$, $x = 53^\circ$ and 127°</p>	$\sin x = \frac{2}{5}$ $x = 23.6^\circ$ $x = 156.4^\circ$	
6	<p>Mark 1 Calculate the volume of the cube</p> <p>Mark 2 Use the volume of a cone to form an equation</p> <p>Mark 3 rearrange this equation find the height of the cone</p>	$V = 7^3 = 343 \text{ cm}^3$ $343 = \frac{1}{3} \times \pi \times 5^2 \times h$ $h = \frac{343 \times 3}{\pi \times 5^2} = 13.1016\dots, \quad h = 13 \text{ cm}$	
7	<p>Mark 1 Recognise right angled triangle</p> <p>Mark 2 consistent statement of Pythagoras</p> <p>Mark 3 calculate a value for the missing side</p> <p>Mark 4 calculate the width</p> <p>2 marks can be given for $x^2 = 13^2 + 10^2, x = 16.4$ so width is 29.4 cm 2 marks can be given for $x^2 = 20^2 - 13^2, x = 15.2$ so width is 28.2 cm</p>	 $x^2 = 13^2 - 10^2$ $x = 8.3$ $13 + 8.3 = 21.3 \text{ cm}$	
8	<p>Mark 1 Know how to find the area of this shape</p> <p>Mark 2 Fraction of the circle for the sector</p> <p>Mark 3 Area of the sector</p> <p>Mark 4 Area of the triangle</p> <p>Mark 5 All calculations correct and final area stated with correct units</p> <p>If the wrong angle is used for the area of the major sector, then only mark 2 is lost. If trig is not used to find the area of the triangle, then mark 4 and 5 are lost.</p>	<p>Area of sector + area of triangle</p> $\frac{290}{360}$ $Area = \frac{290}{360} \times \pi \times 5^2 (= 63.268\dots)$ $Area = \frac{1}{2} \times 5 \times 5 \times \sin 70 (= 11.74\dots)$ $63.268\dots + 11.746\dots = 75 \text{ cm}^2$	