C2	Answers to the Calculator Paper	
1	Mark 1 know how to find a percentage increase $100 + 10 = 110\% = 1.1$ Mark 2 use this answer to find value over four years 50×1.1^6 Mark 3 calculate the answer $88.6\ miles$ 2 marks will be given for a percentage decrease $50 \times 0.9^6 = 26.6\ miles$	
2	Mark 1 correct bracket with square $(x+4)^2$ Mark 2 completed square $\boldsymbol{(x+4)^2 - 5}$	
3	Mark find 85% of the volume of Earth. $0.85 \times 1.1 \times 10^{12}$ Mark 2 give your answer in the correct form. $9.35 \times 10^{11} = \boldsymbol{9.4 \times 10^{11}}$	
4	Mark 1 correct fraction for the sector $\frac{54}{360}$ Mark 2 substitute into the formula for sector area $Area = \frac{54}{360} \times \pi \times 7.3^2$ Mark 3 answer $\boldsymbol{Area = 25.11\ (cm^2)}$ If you find the arc length using the correct fraction and radius then you get 2 marks	
5	Mark 1 factorise $(2x+5)(x-3) = 0$ Mark 2 solve for two answers $\boldsymbol{x = -\frac{5}{2},\ x = 3}$	
6	Mark 1 find the mean $\bar{x} = \frac{156}{6} = 26$ Mark 2 complete the table of values for either formula	

x	$x - \bar{x}$	$(x-\bar{x})^2$
35	9	81
14	-12	144
28	2	4
32	6	36
18	-8	64
29	3	9
$\sum x = 156$	$\sum (x-\bar{x}) = 0$	$\sum (x-\bar{x})^2 = 338$

x	x^2
35	1225
14	196
28	784
32	1024
18	324
29	841
$\sum x = 156$	$\sum x^2 = 4394$

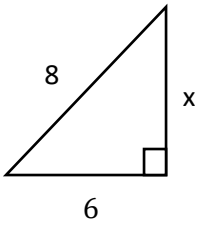
Mark 3 substitute into the correct formulae $s = \sqrt{\frac{338}{6-1}}$ $s = \sqrt{\frac{4394 - \frac{156^2}{6}}{6-1}}$

Mark 4 calculate the standard deviation $\boldsymbol{s = 8.22}$

Mark 5 compare the mean "On **average** the rainfall was higher in the spring of 2021"

Mark 6 compare the standard deviation

"The rainfall was **more consistent** in in the spring of 2021 (less varied)"

7	Radius of the sphere and the cylinder is 3.25 cm. Height of the cylinder is $3 \times 6.5 = 19.5$ Mark 1 substitute into the formula for a sphere $V_{sphere} = \frac{4}{3} \times \pi \times 3.25^3$ Mark 2 calculate volume of 3 spheres $V = 3 \times 143.7933.. = 431.3799 \ldots$ Mark 3 substitution into the formula for a cylinder $V_{cylinder} = \pi \times 3.25^2 \times (\mathbf{6.5 \times 3})$ Mark 4 calculate volume $V_{cylinder} = 647.0699 \ldots$ Mark 5 know to subtract to find the empty space $V = V_{cylinder} - 3 \times V_{sphere},\ V = 647.0699 - 431.3799 = 215.6899 \ldots$ Mark 6 answer with units $\boldsymbol{Volume\ is\ 215.7\ cm^3}$ Full marks will be given for a correct answer of $216\ cm^3$ if all working is shown.	
8	Mark 1 correct substitution into the quadratic formula $x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \times 1 \times (-5)}}{2 \times 1}$ Mark 2 evaluate discriminant $b^2 - 4ac = 24$ Mark 3 calculate both roots correct to **one decimal place** $x = 3.449488 \ldots\ and\ x = -1.44948 \ldots.\ so\ \boldsymbol{x = 3.4\ and\ -1.4}$	
9	Mark 1&2 coordinates of the turning point $(\mathbf{5, 10})$ Mark 3 equation of the axis of symmetry $\boldsymbol{x = 5}$	
10	Mark 1 Recognise right angled triangle  Mark 2 consistent statement of Pythagoras $x^2 = 8^2 - 6^2$ Mark 3 calculate a value for the missing side $x = 5.3$ Mark 4 calculate the height $8 + 5.3 = \boldsymbol{13.3\ cm}$ 2 marks can be given for $x^2 = 8^2 + 6^2, x = 10$ so height is $18\ cm$ 2 marks can be given for $x^2 = 12^2 - 8^2, x = 8.9$ so width is $16.9\ cm$	
11	Mark 1 rearrange equation of straight line to $y = mx + c$ $y = \frac{3}{5}x - 2$ Mark 2 identify the gradient of the straight line $\boldsymbol{m = \frac{3}{5}}$ Mark 3 know that $x = 0$ so $5y = -10,\ y = -2$ $(\mathbf{0, -2})$	