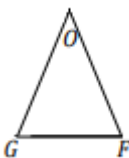| B2	Answers to the Calculator Paper	
1	Mark 1 know how to find a percentage decrease $\quad 100 - 4.25 = 95.75\% = 0.9575$ Mark 2 use this answer to find value over three years $\quad 176500 \times 0.9675^3 \ \ or \ \ \left(\frac{95.75}{100}\right)^3$ Mark 3 calculate the answer $\qquad\qquad\qquad\qquad\qquad$ **£154939.11** 2 marks will be given for a percentage increase $\quad 176500 \times 1.0425^3 = £199973.81$	
2	Mark 1 form an equation $\qquad\qquad\qquad\qquad\qquad\qquad -22 = 5 + 3b$ Mark 2 solve for b (or x) $\qquad\qquad\qquad\qquad\qquad = -27 = 3b \ \ \boldsymbol{b = -9}$	
3	Mark 1 form an equation $\qquad\qquad\qquad\qquad\qquad\qquad 6p + 4t = 2.68$ Mark 2 form a second equation $\qquad\qquad\qquad\qquad\qquad 5p + 3t = 2.15$ Mark 3 show scaling for the simultaneous equations $\qquad\qquad 30p + 20t = 13.40 \ \ or \qquad\quad 18p + 12t = 8.04$ $\qquad\qquad 30p + 18t = 12.90 \qquad\qquad\quad 20p + 12t = 8.60$ Mark 4 and 5 follow a valid strategy to find values for p and for t $\qquad p = 0.28 , t = 0.25$ Mark 6 communicate answer $\qquad$ **One potato costs £0.28 and one turnip is £0.25**	
4	Mark 1 correct substitution into the quadratic formula $\qquad x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \times 3 \times (-9)}}{2 \times 3}$ Mark 2 evaluate discriminant $\qquad\qquad\qquad\qquad\qquad\qquad b^2 - 4ac = 124$ Mark 3 calculate both roots correct to **one decimal place** $\qquad\qquad x = 2.522588\ldots \ \ and \ \ x = -1.189254\ldots. \ \ so \ \ \boldsymbol{x = 2.5 \ and -1.2}$	
5	Mark 1 compare the median $\qquad$ "On **average** the runner's 10K times were faster in February (his times were lower)" Mark 2 compare the SIQR $\quad$ "His times were **more consistent** in February"	
6	Mark 1 identify the angles in one of the triangles in the octagon. The centre angle $\angle GOF$ is $360° \div 8 = 45°$ This triangle is isosceles so $\angle OGF = \angle OFG = 135° \div 2 = 67.5°$ Mark 2 identify angle EFI $\qquad\qquad\qquad \angle EFI = 180° - 2 \times 67.5° = 45°$ Mark 3 find the shaded angle $\qquad\qquad \angle FEI = 180° - 45° - 37° = \boldsymbol{98°}$ Other methods can be used to identify the shaded angle. Angles must either be marked on the diagram or clearly stated in the answer i.e. $\angle GOF$ is $45°$	
7	Mark 1 multiply by 3 to remove the fraction $\qquad\qquad\qquad 4(1 - x) = 6$ Mark 2 expand bracket $\qquad\qquad\qquad\qquad\qquad\qquad 4 - 4x = 6$ Mark 3 solve the equation $\qquad\qquad\qquad\qquad\qquad -4x = 2, \ , x = -\frac{1}{2}$	

8	Radius of the hemisphere and the cone is $30 - 22 = 8\ cm$	
	Mark 1 substitute into the formula for a hemisphere $\qquad V_{hs} = \frac{1}{2} \times \frac{4}{3} \times \pi \times 8^3$	
	or	
	Mark 2 substitute into the formula for a cone $\qquad V_{cone} = \frac{1}{3} \times \pi \times (8)^2 \times 22$	
	Mark 3 know to add the resulting volumes $\qquad V_{cone} + V_{hs}$	
	Mark all calculations correct $\qquad V_{cone} + V_{hs} = 1474.454.. + 1072.330.. = 2546.784$	
	Mark 5 answer with correct units and rounding $\qquad \boldsymbol{V_{cone} = 2500\ cm^3}$	
	Last mark is only available for correct rounding **and** units.	

9	Mark 1 is for the x and y intercepts $\qquad\qquad (0,0)$ and $(6,0)$	
	Mark 2 is for the turning point $\qquad\qquad\qquad (3,-9)$	
	Mark 3 is for all of this information on a correctly annotated u-shaped parabola.	

Parabola with turning point $(3,-9)$, passing through 0 and 6 on the x-axis.

10	Mark 1 use of Pythagoras $\qquad\qquad 18^2 + 10^2 + 10^2$ or $18^2 + 10^2$ or $10^2 + 10^2$	
	Mark 2 use of Pythagoras in 3 dimensions $\qquad 18^2 + 10^2 + 10^2 = 524$	
	$\qquad\qquad or \quad 18^2 + 10^2 = 424,\ so\ \ 424 + 10^2 = 524$	
	Mark 3 find the length of the diagonal $\qquad \sqrt{524} = \boldsymbol{22.89\ cm}$	

11	Mark 1 substitute into the formula for arc length $\qquad 17.9 = \frac{110}{360} \times \pi \times D$	
	Mark 2 Rearrange the equation to find the diameter $\qquad D = \frac{17.9 \times 360}{110 \times \pi} = 18.647$	
	Mark 3 find the length of the radius $\qquad \boldsymbol{radius\ is\ 9.3\ cm}$	

12	Mark 1 calculate the discriminant $\qquad\qquad b^2 - 4ac = 7^2 - 4 \times 3 \times 5 = -11$	
	Mark 2 state the nature of the roots $\qquad$ there are no real roots (roots are non-real).	