Day 162	A Level Maths: B Tier 10-a-day
1 Simplify $\frac{(2x^2)^2 \times 3x^3}{4x^3}$.	
2 For 9 pairs of data, $S_{xx} = 150$, $S_{yy} = 125$ and $S_{xy} = 58$. Find the PMCC (3 s.f.) and describe the correlation.	
3 Solve $2x^2 + 16x < -24$.	
4 8 pairs of height and arm span give $r = -0.683$. One-tailed critical value (5%): 0.6215. Test for negative correlation.	
5 A chord AB subtends an angle of 1.6 radians at the centre O of a circle of radius 10 cm. Find the perimeter of the minor segment, to 3 s.f.	

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6 Solve $\|x - 6\| = \|3x + 4\|$.	
7 A car of mass 1500 kg moves along a horizontal road. The engine works at a constant rate of 60 kW. The resistance to motion is constant at 600 N. Find the acceleration when the speed is 20 m s^{-1}.	
8 £1000 is invested at 4% compound interest per year. Find the least whole number of years for the investment to exceed £3000.	
9 A particle moves so that its position vector relative to O at time t s is $\mathbf{r} = (2t^2 + t)\mathbf{i} + (t^3)\mathbf{j}$ metres. Find the velocity when t = 2, and the speed at that time.	
10 A has position vector $\begin{pmatrix} -5 \\ -2 \end{pmatrix}$ and B has position vector $\begin{pmatrix} -5 \\ -14 \end{pmatrix}$. The point P lies on AB with AP : PB = 1 : 3. Find the position vector of P.	