Day 116	IGCSE 10-a-day
1 The interior angles of a pentagon are $x°$, $(2x + 30)°$, $(2x - 25)°$, $(x + 30)°$, $(2x + 25)°$ (a) Work out the value of x. (b) Work out the size of the largest angle.	
2 A particle P moves in a straight line. After t seconds, its displacement from a fixed point O is s metres, where $s = t^3 - 12t^2 + 45t + 3$ $(t \geq 0)$ Find the acceleration of P at each instant when it is at rest.	
3 $A = \begin{pmatrix} -4 & -1 \\ -1 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} 6 \\ -5 \end{pmatrix}$. (a) Write down the order of matrix A. (b) Work out AB.	
4 Amir puts £3,000 in a savings account. Compound interest is paid at 1% in year 1, 2% in year 2 and 2% in year 3. Work out the amount in the account at the end of year 3. Give your answer to the nearest penny. (Calculator)	
5 The graph of $y = -2x^2 + 8x - 6$ has a turning point at P. Find the equation of the tangent to the curve at P.	

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6 A train travels the first half of a journey at 60 km/h. It travels the second half of the same journey at 90 km/h. Work out the average speed for the whole journey.	
7 Make r the subject of $P = 5\sqrt{r - 2} - 2$	
8 A company makes and sells x thousand items. All amounts are in thousands of pounds. The revenue is $R = x(15 - 2x)$ and the cost is $C = 4 + 7x$. (a) Show that the profit $P = R - C$ is $P = -2x^2 + 8x - 4$. (b) Find the number of items that must be sold for the profit to be a maximum, and this maximum profit.	
9 A sequence is defined by $u_{n+2} = u_{n+1} + u_n$. $u_1 = 3$ and $u_2 = x$. (a) Show that $u_5 = 3x + 6$. (b) Given that $u_5 = 30$, find x and hence work out u_8.	
10 A population is increased by x% in one year and then increased by a further x% the next year. Over the two years the population increases by 69%. Work out the value of x.	