Day 180	IGCSE 10-a-day
1 The interior angles of a pentagon are $x°$, $(x + 5)°$, $(x - 5)°$, $(x + 10)°$, $(x + 30)°$ (a) Work out the value of x. (b) Work out the size of the largest angle.	
2 The ratio of blue to green sweets in a tin is 3 : 8. Then $\frac{1}{3}$ of the blue and $\frac{1}{2}$ of the green are taken out. Work out the ratio of blue to green now.	
3 $y = -2x^3 + 6x - 4$ (a) Show that there is a stationary point at x = 1. (b) By finding the gradient when $x = \frac{1}{2}$ and when $x = \frac{3}{2}$, decide whether it is a maximum or a minimum.	
4 A bag contains marbles. $\frac{1}{4}$ of the marbles are yellow and $\frac{1}{5}$ of the marbles are black. The rest of the marbles, 11 of them, are white. How many black marbles are there?	
5 $f(x) = -6x^{3/2} - 2x - 6x^{-1/2}$ Find $f'(x)$ and work out the value of $f'(4)$.	

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6 $f(x) = 3x + 3$ and $g(x) = 5x^2 + 3$ (a) Find $fg(x)$. (b) Solve $fg(x) = 72$	
7 A curve has equation $y = -x^2 - 6x + k$, where k is a constant. The tangent to the curve at the point where $x = 3$ passes through $(4, -38)$. Find the value of k.	
8 The nth term of a sequence is $4n^2 + 7n + 8$. (a) Show that the difference between the $(n + 1)$th term and the nth term is $8n + 11$. (b) Two consecutive terms of the sequence differ by 155. Find the value of n for the first of these two terms.	
9 $f(x) = \frac{2x - 1}{2x - 2}$ where $x \neq 1$ (a) Show that $ff(x) = x$. (b) Write down $f^{-1}(x)$.	
10 In triangle OAB, $\mathbf{OA} = \mathbf{a}$ and $\mathbf{OB} = \mathbf{b}$. M is on OA and N is on OB, with OM : MA = ON : NB = 2 : 1. (a) Show that MN is parallel to AB. (b) Write down the ratio MN : AB.  	