Day 87	IGCSE 10-a-day
1 The interior angles of a pentagon are $x°$, $(x + 20)°$, $(x + 15)°$, $(x + 30)°$, $(x + 25)°$ (a) Work out the value of x. (b) Work out the size of the largest angle.	
2 $f(x) = 3x - 2x^{-1/2} + 6x^{-3/2}$ Find $f'(x)$ and work out the value of $f'(1)$.	
3 A biased four-sided dice lands on one of four outcomes with these probabilities. 1: 3x; 2: x; 3: 0.05; 4: 0.75 (a) Work out the value of x. (b) The biased four-sided dice is used 100 times. Work out an estimate for the number of times it lands on 1.	
4 $y = 2x^3 + 9x^2 + 12x$ At the point where $x = -3$, is the curve increasing or decreasing? You must show your working.	
5 Factorise fully $5x^3 - 45x$	

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6 ABCD is a parallelogram. A = (−4, −1), B = (0, 5) and C = (0, 0). Find the coordinates of D.	
7 Solve the simultaneous equations $y = x^2 - x - 4$ $y = -2x + 16$	
8 The point A lies on the curve $y = x^2 - 2x + 4$ where x = 0. Find the equation of the normal at A. Give your answer in the form ax + by + c = 0 where a, b and c are integers.	
9 $P = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$ represents a rotation of 90° clockwise about the origin. $Q = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ represents a reflection in the line y = x. (a) Find the matrix that represents P followed by Q. (b) Describe the single transformation that this matrix represents.	
10 Given that $(a + \sqrt{13})^2 = 22 + 6\sqrt{13}$, where a is a positive integer, find the value of a.	