Day 165	IGCSE 10-a-day
1 Solve $\tan x = \sqrt{3}$ for $0° \leq x \leq 360°$. Do not use a calculator.	
2 $y = x(x + 2)(3x - 1)$ Find $\frac{dy}{dx}$.	
3 The position vectors of A and B are $\begin{pmatrix} -1 \\ 0 \end{pmatrix}$ and $\begin{pmatrix} 9 \\ -5 \end{pmatrix}$. The point P lies on AB so that AP : PB = 3 : 2. Find the position vector of P.	
4 Show that $\sqrt{45 + 20\sqrt{5}} = 5 + 2\sqrt{5}$	
5 There are 36 people. 17 of them own a cat and 14 of them own a dog. 7 of them do neither. (a) Work out how many do both. (b) One of the people is chosen at random. Find the probability that they only own a cat.	

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6 $y = x^4 - 18x^2 + 1$ Find the coordinates of the stationary points of the curve and determine the nature of each.	
7 A shop mixes two types of flour. Type A costs £12.00 per kg and type B costs £10.00 per kg. They are mixed in the ratio A : B = 2 : 3. The mixture is sold for £15.12 per kg. Work out the percentage profit.	
8 $y = -x^3 - 6x^2 - 9x$ At the point where x = 3, is the curve increasing or decreasing? You must show your working.	
9 Mo invests £2,500 for 5 years at 2.5% per year simple interest. Ivan invests £2,500 for 5 years at 2.5% per year compound interest. Work out how much more interest Ivan earns than Mo. Give your answer to the nearest penny. (Calculator)	
10 Solve the simultaneous equations $x^2 + y^2 = 74$ $y = x - 12$	