Day 155	A Level Maths: B Tier 10-a-day
1 Prove that if n is odd then $n^2 + 5n + 5$ is odd.	
2 Find the exact value of cot 315°, giving your answer with a rational denominator.	
3 A particle moves so that its position vector relative to O at time t s is $r = (t^2 + t)\mathbf{i} + (t^3 - 3t)\mathbf{j}$ metres. Find the velocity when t = 3, and the speed at that time.	
4 For 15 pairs of data, $S_{xx} = 50$, $S_{yy} = 125$ and $S_{xy} = 74$. Find the PMCC (3 s.f.) and describe the correlation.	
5 Find the exact value of $\arctan\left(\tan \frac{3\pi}{4}\right)$.	

Day 155	A Level Maths: B Tier 10-a-day
6 Prove, by exhaustion, that a cube number cannot be written in the form $9k + 6$, where k is an integer.	
7 A particle moves in a straight line. At time t seconds its velocity is $v = 3t^2 - 3t + 3$ m s^{-1}. Find the distance moved between $t = 0$ and $t = 2$. (The particle does not change direction.)	
8 A factory says a proportion 0.5 of its parts are defective. In a sample of 30 parts, 12 are defective. Test, at the 5% significance level, whether the proportion is different from 0.5.	
9 The line $4x - 3y = k$ is a tangent to the circle $(x - 4)^2 + (y - 2)^2 = 25$. Find the two possible values of k.	
10 Solve $\tan(x + 50°) = 4$ for $0 \leq x \leq 360°$, giving answers to 1 d.p.	