Day 93	A Level Maths: C Tier 10-a-day
1 Simplify $1 + \tan^2 x$.	
2 $f(x) = x^2 + 1, x \geq 0$. Find $f^{-1}(x)$ and state its domain.	
3 A string pulls a box with a force of 10 N at an angle of 45° above the horizontal. Find the horizontal and vertical components of the force, to 3 s.f.	
4 By writing 105° as 60° + 45°, find the exact value of cos 105°.	
5 Use proof by exhaustion to show that $n^3 + 5n$ is divisible by 6 for every integer n with $1 \leq n \leq 4$.	

Day 93	A Level Maths: C Tier 10-a-day
6 A population is N(μ, 8^2). H_0: $\mu = 175$, H_1: $\mu < 175$. A sample of 9 has mean $\bar{x} = 171.27$. Test at the 5% level. Critical value: $z = -1.645$.	
7 Find the set of values of x satisfying both $2x - 5 < -13$ and $x^2 + 9x + 18 < 0$.	
8 X ~ B(30, p). H_0: $p = 0.6$, H_1: $p > 0.6$. Find the critical region for a test at the 10% significance level.	
9 Use integration by parts to find $\int x \ln x \, dx$.	
10 A particle is on the point of sliding down a rough plane inclined at α to the horizontal, where $\tan \alpha = \frac{8}{15}$. Find the coefficient of friction.	