Day 54	A Level Maths: B Tier 10-a-day

1 Solve $-x - 3 \leq 3x - 9$.

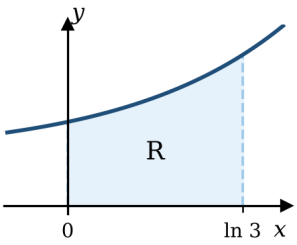
2 Use the trapezium rule with 4 strips to estimate

$\int_1^3 x \ln(x + 1)\, dx$,

giving your answer to 3 significant figures.

3 Statement: "If $x^2 > 4$ then $x > 2$."
Give a counter-example to show the statement is false.

4 The region R is bounded by the axes, the line $x = \ln 3$ and the curve $y = 2e^x + 3$. Find the exact area of R.



5 A particle moves on a straight line. Its displacement from O at time t seconds is $s = 3t^3 + 3t^2 - t$ metres.
Find its velocity and acceleration when $t = 2$.

Day 54	A Level Maths: B Tier 10-a-day
6 Given that $\tan\theta = 3$ and θ is acute, find the exact value of $\operatorname{cosec}\theta$.	
7 The line $12x - 5y = k$ is a tangent to the circle $(x-1)^2 + (y+1)^2 = 169$. Find the two possible values of k.	
8 A coin is thought to land heads with probability 0.2. It is tossed 40 times and lands heads 14 times. Test, at the 5% significance level, whether the probability of heads is different from 0.2.	
9 A block of mass 3 kg is released from rest on a rough plane inclined at angle α to the horizontal, where $\tan\alpha = \frac{3}{4}$. The coefficient of friction is 0.125. Take g = 9.8 m s^{-2}. Find the acceleration down the plane, and the distance moved in 2 s.	
10 The masses (kg) of parcels are normally distributed. $P(X < 88) = 0.1587$ and $P(X > 112) = 0.1587$. Find the mean and standard deviation (3 s.f.).	