Day 151	A Level Maths: C Tier 10-a-day
1 A sequence is defined by $u_{n+1} = \frac{1}{3} u_n + 6$. The sequence converges to a limit L. Find L.	
2 For 7 data pairs, with advertising spend (£s hundreds) from 10 to 20, the regression line is $S = 4 + 7a$. Estimate sales (£s thousands) when $a = 24$ and comment on the reliability.	
3 A car moving in a straight line with constant acceleration increases its speed from 1 m s^{-1} to 5 m s^{-1} in 9 s. Find the distance it travels in this time.	
4 $x^2 + kx + 49 = 0$ has equal roots. Find the possible values of k.	
5 Solve $\cos(x - 20°) = -\frac{1}{2}$ for $0° \leq x \leq 360°$.	

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6 $X \sim B(25, p)$. H_0: $p = 0.4$, H_1: $p > 0.4$. Find the critical region for a test at the 5% significance level.	
7 A ball is projected from level ground with velocity $(5\mathbf{i} + 9.8\mathbf{j})$ m s^{-1} ($\mathbf{i}$ horizontal, $\mathbf{j}$ vertically up). Take $g = 9.8$ m s^{-2}. (a) Find the time of flight. (b) Find the greatest height reached.	
8 $x = 4t^2 + 3$, $y = 2t^3 - t$. Find dy/dx in terms of t, and its value when $t = 1$.	
9 Solve the simultaneous equations: $y = x^2 + x + 6$, $y = 2x + 6$.	
10 Solve $4 \tan x = -9$ for $0 \leq x \leq 2\pi$. Give your answers to 3 significant figures.	