Day 97	A Level Maths: C Tier 10-a-day
1 Differentiate with respect to x: (a) $5e^x + 5 \ln x$ (b) $e^{5x} + \sin 5x$	
2 Find the remainder when $-2x^3 + x^2 - 3x + 6$ is divided by $(2x - 3)$.	
3 Cars pass a checkpoint at an average rate of 0.5 per hour, at random. Find the probability of exactly 1 in 3 hours, to 3 s.f.	
4 A particle is thrown vertically upwards with speed 49 m s^{-1}. Take g = 9.8 m s^{-2}. (a) Find the time taken to reach its greatest height. (b) Find the greatest height reached.	
5 Differentiate y = sec 2x with respect to x.	

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6 Prove by contradiction that there are no integers x and y such that $6x + 9y = 97$.	
7 A crate is on the point of sliding down a rough plane inclined at α to the horizontal, where $\tan \alpha = \frac{3}{4}$. Find the coefficient of friction.	
8 The line $y = -x + k$ is a tangent to the curve $y = x^2 - 3x - 3$. Find the value of k.	
9 A is acute and $\cos A = \frac{15}{17}$. Find the exact values of sin 2A and cos 2A.	
10 The probability that a patient takes the drug is 0.4. If so, the probability that the patient recovers is 0.8; otherwise it is 0.3. Given that the patient recovers, find the probability that a patient takes the drug.	