Day 203	A Level Maths: C Tier 10-a-day
1 In a geometric sequence $u_3 = 45$ and $u_4 = 15$. Find the first term and the common ratio.	
2 Variables x and y satisfy $y = ab^x$. A graph of $\log_{10} y$ against x is a straight line with gradient 0.6 and intercept 0.5. Find a and b to 3 significant figures.	
3 A particle moves in a straight line with velocity $v = (6t^2 - 2t + 3)$ m s^{-1} at time t seconds. Find the distance travelled between t = 2 and t = 4 (the particle does not turn round).	
4 θ is small and measured in radians. Use the small angle approximations to find an approximation for $\cos\theta + \theta \sin 5\theta$.	
5 A brick is dropped from rest from the top of a cliff of height 78.4 m. Take g = 9.8 m s^{-2} and ignore air resistance. Find (a) the time taken to reach the ground, (b) its speed on hitting the ground.	

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6 Each time a spinner is spun the probability of red is 0.2. Find the probability of getting red at least once in 5 spins, to 3 s.f.	
7 Use the substitution $u = x^2 + 2$ to find $\int \frac{3x}{x^2 + 2}\, dx$.	
8 Find the range of values of k for which $kx^2 + 6x + 8 = 0$ has real roots.	
9 $X \sim B(40, 0.2)$. Use a normal approximation to find $P(X \geq 7)$, to 3 s.f.	
10 Divide $f(x) = 2x^4 + 9x^3 + x^2 - 9x + 12$ by $(x + 4)$. Find the quotient and the remainder.	