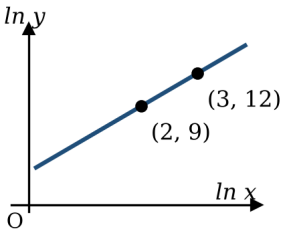
Day 213	A Level Maths: A Tier 10-a-day
1 Find the coefficient of x^2 in the expansion of $(1 + 4x)^5$.	
2 Solve $2\cos^2 x + \sin x - 2 = 0$ for $0 \leq x \leq 2\pi$.	
3 A charity raises £300 in its first year and in each later year raises £30 more than in the previous year. (a) How much does it raise in year 16? (b) In which year does the total raised first exceed £10000?	
4 The probability that a seed germinates is 0.15. In 16 independent trials, find the probability that this happens (a) exactly 2 times (b) fewer than 2 times (c) at least 2 times.	
5 $y = \cot(x)$. Find $\frac{dy}{dx}$ and its exact value at $x = \frac{\pi}{4}$.	

Day 213	A Level Maths: A Tier 10-a-day
6 A 2 kg particle moves on a smooth horizontal line. At time t s a single force of (36 − 6t) N acts along the line. When t = 0 its speed is 2 m s^{-1}. Find (a) its speed when t = 10, (b) its greatest speed.	
7 $u_1 = 0$ and $u_{n+1} = \frac{1}{4} u_n + 6$. (a) Find the limit L of the sequence as $n \to \infty$. (b) Find the least n for which $\lvert u_n - L \rvert < 0.01$.	
8 The mass of an egg is $N(73, 3^2)$. An egg is classed as 'special' if its mass is less than 70. 11 eggs are chosen at random. Find the probability that exactly 2 are special (3 s.f.).	
9 The diagram shows the graph of ln y against ln x for $y = A x^n$. Find the value of n and the exact value of A. 	
10 A lift of mass 400 kg carries a person of mass 75 kg. The cable tension is 4560 N and the lift is accelerating. Find (a) the magnitude and direction of the acceleration, (b) the force of the floor on the person. Take g = 9.8.	