Day 305	A Level Maths: C Tier 10-a-day

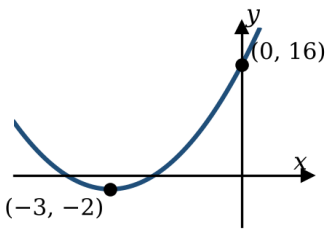
1 $x_{n+1} = \ln(x_n + 5) + 1$, with $x_0 = 2$.
Find x_1, x_2 and x_3 to 3 decimal places.

2 A particle of mass 5 kg hangs from a light string and is at rest. Taking g = 9.8 m s^{-2}, find the tension in the string.

3 $\mathbf{a} = 3\mathbf{i} + 2\mathbf{j}$ and $\mathbf{b} = \frac{3}{2}\mathbf{i} + k\mathbf{j}$, where k is a constant.
Given that a and b are parallel, find the value of k.

4 A particle moves in a straight line. Its acceleration at time t seconds is $(2t + 3)$ m s^{-2}.
When t = 0 its velocity is 4 m s^{-1}.
Find its velocity when t = 5.

5 The diagram shows a sketch of a quadratic curve.
Find its equation in the form $y = a(x - p)^2 + q$.



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6 The number of events in one interval has a Poisson distribution with mean 0.5. Find the probability of exactly 1 in one such interval, to 3 s.f.	
7 $f(x) = \sqrt{x - 4} - 2$. State the largest possible domain and the range of f.	
8 $X \sim B(120, 0.4)$. Use a normal approximation to find $P(X \leq 45)$, to 3 s.f.	
9 Given that $dy/dx = 3xy$ and $y = 3$ when $x = 0$, find y in terms of x.	
10 Solve $4^x = 512$.	