Day 297	A Level Maths: C Tier 10-a-day
1 A cable pulls a box with a force of 30 N at an angle of 60° above the horizontal. Find the horizontal and vertical components of the force, to 3 s.f.	
2 A bag has 3 red and 5 blue sweets. Two are taken at random without replacement. Find the probability that they are different colours.	
3 Write $-2x^2 - 12x - 20$ in the form $a(x + p)^2 + q$.	
4 For a data set $Q_1 = 28$ and $Q_3 = 58$. A value is an outlier if it is more than 1.5 × IQR above Q_3 or below Q_1. Determine whether -12 and 33 are outliers.	
5 Find the equation of the tangent to the curve $y = e^{3x} + x$ at the point where $x = 0$.	

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6 Find the set of values of k for which $x^2 + kx + 16 = 0$ has two distinct real roots.	
7 (a) Show that $x^2 - x - 2 = 0$ can be rearranged to $x = 1 + \frac{2}{x}$. (b) Use x_{n+1} = this formula with $x_0 = 2$ to find x_1, x_2 to 3 d.p.	
8 Write $\sqrt{150}$ in the form $p\sqrt{q}$, where q is an integer as small as possible.	
9 f(x) = 6 sin x + 8 cos x + 4. Write f(x) in the form R sin(x + α) + 4, with α in degrees to 1 d.p., and state the maximum value of f(x).	
10 A train starts from rest and accelerates uniformly at 4 m s^{-2} for 6 s, then travels at constant speed for a further 30 s. Find the total distance travelled.	