Day 9	A Level Maths: C Tier 10-a-day
1 A sector of a circle has radius 4 cm and angle 1.6 radians. Find (a) the arc length, (b) the perimeter of the sector.	
2 Write $-2x^2 - 8x - 13$ in the form $a(x + p)^2 + q$.	
3 Three forces $(p\mathbf{i} + q\mathbf{j})$ N, $(4\mathbf{i} - \mathbf{j})$ N and $(2\mathbf{i})$ N act on a particle which is in equilibrium. $\mathbf{i}$ and $\mathbf{j}$ are perpendicular unit vectors. Find the values of p and q.	
4 An arithmetic series has first term 9, last term 117 and 19 terms. Find the sum of the series.	
5 The continuous random variable X has probability density function $f(x) = k(x + 3)$ for $0 \leq x \leq 1$, and 0 otherwise. Find the value of k.	

Day 9	A Level Maths: C Tier 10-a-day
6 A ball is projected from level ground with velocity $(14\mathbf{i} + 9.8\mathbf{j})$ m s^{-1} ($\mathbf{i}$ horizontal, $\mathbf{j}$ vertically up). Take g = 9.8 m s^{-2}. (a) Find the time of flight. (b) Find the horizontal range.	
7 Express $\frac{-2x + 4}{(x - 5)(x - 4)}$ in partial fractions.	
8 Find the exact value, in radians, of (a) arccos(−1) (b) arctan(1)	
9 X ~ B(20, p). H_0: p = 0.1, H_1: p ≠ 0.1. In a sample, x = 4. Test at the 10% significance level.	
10 Given that dy/dx = 4xy and y = 3 when x = 0, find y in terms of x.	