Day 10	A Level Maths: B Tier 10-a-day
1 Evaluate $\sum_{r=4}^{12}(4r - 3)$.	
2 Given that $y = (2x^2 + 3)^4$, find $\frac{dy}{dx}$, and the gradient of the curve when $x = -1$.	
3 A ball is projected vertically upwards from ground level with speed 29.4 m s^{-1}. Take g = 9.8 m s^{-2}. Find (a) the greatest height reached, (b) the total time before it returns to the ground.	
4 Large data set: mean windspeed (knots) at Leeming has mean 8, sd 4. Outliers are more than 3 sd from the mean. Are the values 17 and −6 outliers?	
5 A car of mass 1500 kg moves along a horizontal road. The engine works at a constant rate of 50 kW. The resistance to motion is constant at 500 N. Find the acceleration when the speed is 10 m s^{-1}.	

Day 10	A Level Maths: B Tier 10-a-day
6 R: it rains; L: Ali is late. P(R) = 0.25, P(L | R) = 0.6, P(L | R') = 0.2. (a) Find P(L). (b) Find P(R | L).	
7 The circle C has equation $(x + 4)^2 + (y - 4)^2 = 10$. The point P(−3, 7) lies on C. Find an equation of the tangent to C at P, in the form ax + by + c = 0 with integer a, b, c.	
8 The variables x and y satisfy $y = ax^n$. A graph of ln y against ln x is a straight line with gradient 2 that passes through (0, ln 5). Find the values of a and n.	
9 An arithmetic sequence has 9th term −31 and 13th term −55. (a) Find the first term and the common difference. (b) Find the sum of the first 30 terms.	
10 Find the exact value of $\int_0^{\frac{\pi}{6}} \cos^2 3x \, dx$.	