Day 183	A Level Maths: C Tier 10-a-day
1 Simplify $\sqrt{3} + \sqrt{108}$, giving your answer in the form $p\sqrt{3}$.	
2 $y = x^3 + 6x^2 + 9x - 1$. Find the coordinates of the stationary points and determine their nature.	
3 Write $3x^2 - 6x - 4$ in the form $a(x + p)^2 + q$.	
4 Find the exact value of $\int_1^3 \frac{5}{x}\,dx$.	
5 30 pairs of data on height and arm span have $r = -0.26$. Test, at the 5% significance level, for evidence of negative correlation. The critical value is -0.3061.	

Day 183	A Level Maths: C Tier 10-a-day
6 Car A passes a point O at constant speed 24 m s^{-1}. At that instant car B starts from rest at O with constant acceleration 4 m s^{-2} in the same direction. Find the time when B catches up A.	
7 X ~ B(40, p). H_0: p = 0.2, H_1: p > 0.2. Find the critical region for a test at the 1% significance level.	
8 A car of mass 1500 kg tows a caravan of mass 400 kg on a level road with acceleration 1 m s^{-2}. Resistances: 300 N on the car, 100 N on the caravan. Find the driving force and the tow bar tension.	
9 a = $\mathbf{i} - \mathbf{j} - 3\mathbf{k}$ and b = $2\mathbf{i} + 2\mathbf{j}$. Find the angle between a and b, to 1 decimal place.	
10 The diagram shows the graph of $y = \frac{k}{x - a} + c$ with its asymptotes. Find the values of a, c and k. 	