Day 199	A Level Maths: B Tier 10-a-day
1 Describe the single transformation that maps the graph of y = f(x) onto the graph of: (a) y = f(2x) (b) y = f(x) + 6 (c) y = 2f(x)	
2 A cyclist moves in a straight line with constant acceleration. Its initial speed is 10 m s^{-1}, its final speed is 30 m s^{-1} and it travels 80 m. Find the time taken.	
3 f(x) = x + 3 and $g(x) = x^2 + 3$ for $x \in \mathbb{R}$. (a) Find fg(x). (b) Solve gf(x) = 52.	
4 The curve C has equation $y = x \ln x - 2x$. Find the equation of the normal to C at the point where x = 1, in the form y = mx + c.	
5 A particle moves on a straight line. Its displacement from O at time t seconds is $s = 4t^3 - t^2 - 6t$ metres. Find its velocity and acceleration when t = 3.	

Day 199	A Level Maths: B Tier 10-a-day
6 Find the exact value of $\int_0^2 \frac{4x + 6}{x^2 + 3x + 2}\,dx$, giving your answer in the form a ln b.	
7 A curve has parametric equations $x = 3t + 1$, $y = 2t^2 + 4t + 2$. The line $y = 2x + 4$ meets the curve at two points. Find the coordinates of these points.	
8 Solve $\sin 2x = \sin x$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.	
9 The time, X minutes, to complete a task is normally distributed with mean 150 and s.d. 5. A random sample of 4 is taken. Find the probability that the mean time is more than 152 (3 s.f.).	
10 20 pairs of height and arm span give $r = -0.515$. Two-tailed critical value (5%): 0.4438. Test for correlation.	