Day 186	A Level Maths: B Tier 10-a-day
1 $f(x) = e^x - 3x$. Use the Newton-Raphson method with $x_0 = 0.6$ to find x_1 and x_2, to 4 d.p.	
2 A circle has equation $x^2 + y^2 - 8x - 10y + 37 = 0$. Find the coordinates of its centre and its radius.	
3 A summary of the ages, a years, of 9 members of a club gives $\Sigma a = 212$ and $\Sigma a^2 = 6670$. Find the mean and the standard deviation (3 s.f.).	
4 Solve $7^x > 288$, giving your answer to 3 s.f.	
5 A circle has centre $(-4, 1)$ and passes through the point $(-4, 3)$. Find an equation of the circle.	

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6 Solve $\log_2(x + 20) - \log_2(x - 1) = 2$.	
7 A particle moves so that at time t s its velocity is $\mathbf{v} = (t^2 + 3)\mathbf{i} + (2t - 6)\mathbf{j}$ m s^{-1}. Find the time when the particle is moving in the direction of $\mathbf{i}$, and its speed then.	
8 The time, X minutes, to complete a task is normally distributed with mean 150 and s.d. 5. A random sample of 25 is taken. Find the probability that the mean time is more than 152 (3 s.f.).	
9 $f(x) = 2x^3 + kx^2 + 4x - 16$. Given that $(x - 1)$ is a factor of f(x), (a) find the value of k, (b) factorise f(x) completely.	
10 A uniform rod AB of length 4 m and mass 5 kg hangs horizontally from two vertical strings attached 1 m from A and 1 m from B. A particle of mass 5 kg is attached 1.5 m from A. Take g = 9.8 m s^{-2}. Find the tension in each string.	