Day 203	A Level Maths: B Tier 10-a-day
1 Solve $\tan x = 3$ for $0 \leq x \leq 2\pi$, giving answers to 3 significant figures.	
2 A cyclist moves in a straight line with constant acceleration. Its initial speed is 11 m s^{-1}, its final speed is 23.5 m s^{-1} and the motion lasts 5 s. Find the distance travelled.	
3 Find (a) $\int \frac{6}{4x+4}\,dx$, (b) the exact value of $\int_0^2 \frac{6}{4x+4}\,dx$.	
4 A particle moving in a straight line with constant acceleration increases its speed from 2 m s^{-1} to 18 m s^{-1} while covering 40 m. Find (a) the acceleration, (b) the time taken.	
5 Faults occur at random in a cable at an average rate of 3 per hour of operation. Find the probability that in 15 minutes there are exactly 0 (3 s.f.).	

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6 Express $6\cos\theta + 8\sin\theta$ in the form $R\cos(\theta - \alpha)$, where $R > 0$ and $0 < \alpha < 90°$. Give α to 1 d.p.	
7 Express $\frac{-7x - 12}{(x + 4)(x - 4)}$ in partial fractions.	
8 Packet masses are normal, s.d. 5 g. Claimed mean 50 g; 16 packets have mean 51.7 g. Test at the 5% level whether the true mean is greater than 50.	
9 Solve $27^{2x - 4} = 3^{-3x + 3}$.	
10 (a) Expand $(1 - 2x)^{-1}$ in ascending powers of x up to and including the term in x^3. (b) State the range of values of x for which the expansion is valid.	