Day 328	A Level Maths: B Tier 10-a-day
1 Solve $\tan 2x = 0.4$ for $0 \leq x \leq 360°$, giving answers to 1 d.p.	
2 Large data set: mean temperature (°C) at Heathrow has mean 12, sd 3. Outliers are more than 3 sd from the mean. Are the values 22 and 5 outliers?	
3 A toy car slides from rest down a line of greatest slope of a smooth plane inclined at α, where $\sin\alpha = \frac{3}{5}$ to the horizontal. Take $g = 9.8$ m s^{-2}. Find its acceleration, and the distance it travels in 4 s.	
4 Solve $2\ln x = \ln(x + 2)$.	
5 A sports car starts from rest and accelerates at 4 m s^{-2}. At that moment it is passed by a coach travelling at constant speed 20 m s^{-1}. Find how long it takes to catch up, and the distance travelled.	

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6 Solve $e^{2x} - 11e^{x} + 24 = 0$, giving your answers as exact values.	
7 $f(x) = \frac{3x + 2}{x - 2}$ for $x \in \mathbb{R}$, $x \neq 2$. (a) Find $f^{-1}(x)$. (b) State the domain of f^{-1}.	
8 $X \sim B(25, p)$. H_0: $p = 0.4$ is to be tested against H_1: $p < 0.4$ at the 1% significance level. Find the critical region and the actual significance level.	
9 Express $\frac{12}{5 + 3\sqrt{3}}$ in the form $p + q\sqrt{3}$, where p and q are integers.	
10 Find the coefficient of x^3 in the expansion of $(2 - 2x)^9$.	