Day 43	A Level Maths: B Tier 10-a-day
1 A lorry of mass 800 kg moves along a straight horizontal road. The engine produces a driving force of 1500 N and the resistance to motion is 500 N. Find the acceleration of the lorry.	
2 Solve $\sin x = -\frac{\sqrt{3}}{2}$ for $0 \leq x \leq 360°$.	
3 $f(x) = 2x^3 + kx^2 + 38x - 24$. Given that $(x - 1)$ is a factor of $f(x)$, (a) find the value of k, (b) factorise $f(x)$ completely.	
4 Differentiate $y = 5 \tan x$ with respect to x, and find the exact gradient when $x = \frac{\pi}{3}$.	
5 Find the coefficient of x^2 in the expansion of $(2 + 2x)(1 + 3x)^7$.	

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6 Solve $\log_{10} x + \log_{10}(x + 9) = 1$.	
7 The mass X g of a flour bag is normal with mean 250. Given P(X < 250.8) = 0.95, find the standard deviation (3 s.f.).	
8 A package is thrown horizontally at 8 m s^{-1} from the top of a building 11.025 m above level ground. Take g = 9.8 m s^{-2}. Find the time of flight and the horizontal distance from the base where it lands.	
9 The probability that a student passes a driving test first time is thought to be 0.2. In a sample of 50 students, 3 pass first time. Test, at the 5% significance level, whether the probability is different from 0.2.	
10 $f(x) = \frac{-4x - 4}{3x - 4}$ for $x \in \mathbb{R}$, $x \neq \frac{4}{3}$. (a) Find $f^{-1}(x)$. (b) State the domain of f^{-1}.	