Day 42	A Level Maths: B Tier 10-a-day
1 Solve the simultaneous equations $2x + y = -10$ $x^2 + y^2 = 65$	
2 The mass X g of a flour bag is normal with mean 170, s.d. 8. Find, to 3 s.f., the probability a value is (a) less than 174, (b) between 174 and 178.	
3 Evaluate $8^{\frac{1}{3}}$.	
4 Find the coordinates of the stationary point of the curve $y = xe^{-2x}$, and determine its nature.	
5 P(B) = 0.3, P(A | B) = 0.2 and P(A) = 0.7. (a) Find $P(A \cap B)$. (b) Find P(B | A). (c) Find $P(A \cup B)$.	

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6 Solve $7 \sin x + 4 \cos^2 x - 7 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.	
7 A particle of mass 10 kg is suspended in equilibrium by two light strings attached to a horizontal ceiling. The strings make angles α and β with the ceiling, where $\tan \alpha = \frac{12}{5}$ and $\tan \beta = \frac{4}{3}$. Take $g = 9.8$ m s^{-2}. Find the tension in each string.	
8 Given that $\sqrt{7}$ is irrational, prove by contradiction that $5 + 2\sqrt{7}$ is irrational.	
9 A puck of mass 4 kg is moving on a smooth horizontal surface at 1 m s^{-1} when a constant horizontal force of 12 N, in the direction of motion, acts for 6 s. Find the speed of the puck at the end of this time and the distance it moves.	
10 Differentiate $y = 2 \tan x$ with respect to x, and find the exact gradient when $x = \frac{\pi}{3}$.	