Day 241	A Level Maths: C Tier 10-a-day
1 Differentiate with respect to x: (a) $5\,e^{4x}$ (b) $e^{5x} + \sin 4x$	
2 A curve has parametric equations $x = t + 4$, $y = t^2 + 5$. The point P has y-coordinate 14 and positive t. Find the coordinates of P.	
3 Find (a) $\int 15\,e^{3x}\,dx$ (b) $\int 15\,\sec^2 3x\,dx$	
4 A lift of mass 600 kg is raised by a vertical cable with constant acceleration 0.2 m s^{-2} upwards. Take g = 9.8 m s^{-2}. Find the tension in the cable.	
5 Of 130 people, 83 are women. 43 of the women and 29 of the men play an instrument. One person is chosen at random. Given that the person is a woman, find the probability that they play an instrument.	

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6 A car of mass 800 kg tows a caravan of mass 400 kg on a level road with acceleration 0.25 m s^{-2}. Resistances: 400 N on the car, 200 N on the caravan. Find the driving force and the tow bar tension.	
7 X ~ B(20, p). H_0: p = 0.1, H_1: p > 0.1. In a sample, x = 4. It is given that P(X ≥ 4) = 0.133. Test H_0 at the 10% significance level.	
8 A is (6, 4) and B is (12, 6). Find the equation of the perpendicular bisector of AB, in the form ax + by = c with integer a, b and c.	
9 Express $\frac{-5x-21}{(x+5)(x+3)}$ in the form $\frac{A}{x+5}+\frac{B}{x+3}$. Find the values of A and B.	
10 Express $\frac{5x+6}{(x+4)^2}$ in the form $\frac{A}{(x+4)}+\frac{B}{(x+4)^2}$.	