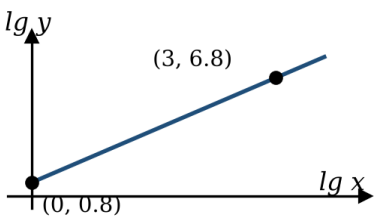
Day 338	A Level Maths: S Tier 10-a-day
1 10 recorded times (seconds) have mean 53 and standard deviation 2. One value was recorded as 48 but should have been 53. Find the correct mean and the correct standard deviation.	
2 A cone with its vertex downwards and semi-vertical angle α, where $\tan\alpha = \frac{1}{2}$, is filled at 12π cm^{3}s^{-1}. Find the rate at which the depth h is rising when h = 5 cm. ($V = \frac{1}{3}\pi r^2 h$)	
3 $g(x) = x^2 + 5$. Also $fg(x) = 4x^2 + 15$, where f is a linear function. (a) Find f(x). (b) Solve gf(x) = 54.	
4 Find the exact gradient of the curve $y = 5^{2x+2}$ at the point where x = 1.	
5 $y = ax^n$. The graph of lg y against lg x is the straight line shown. Find a and n, giving a to 3 s.f. 	

Day 338	A Level Maths: S Tier 10-a-day
6 Express $\frac{-2x^2 + 14x - 20}{(x + 3)(x - 1)^2}$ in the form $\frac{A}{(x + 3)} + \frac{B}{(x - 1)} + \frac{C}{(x - 1)^2}$.	
7 A box of weight 50 N is pulled at constant speed along rough horizontal ground ($\mu = 0.75$) by a force P N at angle θ above the horizontal. (a) Find P when $\tan\theta = \frac{4}{3}$. (b) Find the least possible value of P as θ varies, and the corresponding θ to 1 d.p.	
8 In the expansion of $(1 + kx)^n$, where n is a positive integer, the coefficient of x is 24 and the coefficient of x^2 is 240. Find n and k.	
9 A population N satisfies $\frac{dN}{dt} = -0.02N^2$, with N = 50 when t = 0. Find N when t = 9, and the time taken for N to halve.	
10 A plank of mass 8 kg lies on a smooth horizontal table, with a block of mass 1 kg on it ($\mu = 0.2$ between them). A horizontal force P N acts on the plank. (a) Find the greatest P for which the block does not slip. (b) Find the accelerations of block and plank when P = 35.28. Take g = 9.8 m s^{-2}.	