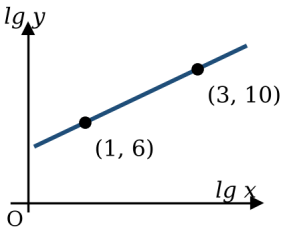
Day 307	A Level Maths: A Tier 10-a-day
1 P(A) = 0.55, P(B) = 0.35 and P(A ∩ B) = 0.05. Find (a) P(A ∪ B) (b) P(B | A) (c) P(A | B′)	
2 Find the exact value of $\int_2^3 \frac{2}{2x+1}\,dx$.	
3 Express $\frac{-3+4\sqrt{2}}{1+\sqrt{2}}$ in the form $p + q\sqrt{2}$, where p and q are rational numbers.	
4 A 2 kg particle rests on a rough plane inclined at α, $\tan\alpha = \frac{12}{5}$, μ = 0.5. A force of P N acts up a line of greatest slope and the particle stays at rest. Find the range of values of P. Take g = 9.8. Give answers to 3 s.f. if not exact.	
5 $X \sim N(\mu, \sigma^2)$, with P(X < 42) = 0.1587 and P(X > 45) = 0.3085. Find μ and σ.	

Day 307 **A Level Maths: A Tier 10-a-day**

6 A curve has parametric equations $x = 2t^2 - 3$, $y = t(t^2 - 16)$.
Find the coordinates of the points where the curve meets the x-axis.

7 A particle P has position vector $\mathbf{r} = (t^3 - t)\mathbf{i} + (2t^2 - 4t)\mathbf{j}$ metres at time t s. Find (a) the speed of P when t = 4, (b) the value of t when P is moving parallel to $\mathbf{i}$. Give answers to 3 s.f. if not exact.

8 The diagram shows the graph of lg y against lg x for $y = A x^n$.
Find the value of n and the value of A.



9 Express $\frac{2x^2 - 17x - 15}{(x - 3)(x + 1)^2}$ in the form $\frac{A}{(x - 3)} + \frac{B}{(x + 1)} + \frac{C}{(x + 1)^2}$, and find A, B and C.

10 The value of an investment is modelled by $V = 100\, e^{kt}$, where t is time in years.
After 3 years, V = 200.
Find (a) the exact value of k, (b) the time for V to reach 5000, to 3 s.f.