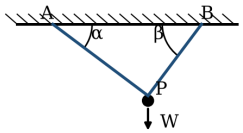
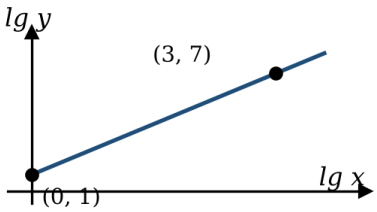
Day 95	A Level Maths: S Tier 10-a-day
1 Solve $x^{\frac{2}{3}} - 4x^{\frac{1}{3}} + 3 = 0$.	
2 A ball is thrown vertically upwards from ground level. It is more than 39.2 m above the ground for 2 s. Find the speed of projection and the greatest height reached. Take g = 9.8 m s^{-2}.	
3 The curve $y = ax^n$ passes through (1, 3) and (3, 81). Find the values of a and n.	
4 The sum of the first n terms of a sequence is $S_n = 4n^2 + n$. (a) Find an expression for u_n. (b) Find the least n for which $u_n > 332$.	
5 Use the trapezium rule with 6 strips to estimate $\int_1^3 \frac{1}{1+x^2}\,dx$, to 4 s.f. Is it an overestimate or an underestimate? Explain.	

Day 95 **A Level Maths: S Tier 10-a-day**

6 A particle P of weight 11 N hangs in equilibrium from two light strings AP and BP attached to a horizontal ceiling at A and B (see diagram), where $\tan\alpha = \frac{3}{4}$ and $\tan\beta = \frac{4}{3}$.
Find (a) the tension in each string, (b) the greatest weight P could have if neither tension may exceed 60.8 N.



7 $y = ax^n$. The graph of lg y against lg x is the straight line shown.
Find a and n, giving a to 3 s.f.



8 $f(\theta) = \frac{1}{35 + 20\sin\theta + 21\cos\theta}$
(a) Write $20\sin\theta + 21\cos\theta$ as $R\sin(\theta + \alpha)$, $R > 0$, $0 < \alpha < 90°$.
(b) Find the greatest and least values of $f(\theta)$, and the smallest positive θ at which the greatest value occurs, to 1 d.p.

9 When a polynomial f(x) is divided by $(x - 3)$ the remainder is -9; when divided by $(x + 2)$ the remainder is -4. Find the remainder when f(x) is divided by $(x - 3)(x + 2)$.

10 The number of customers arriving at a shop in one hour is Po(40).
Use a suitable approximation to find $P(X \geq 58)$, to 3 significant figures.