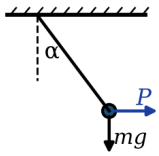
Day 89	A Level Maths: B Tier 10-a-day
1 Statement: "If $x^2 > 81$ then $x > 9$." Give a counter-example to show the statement is false.	
2 A curve has parametric equations $x = 2\cos t$, $y = 3\sin t$. Find $\frac{dy}{dx}$ in terms of t, and its exact value when $t = \frac{\pi}{6}$.	
3 A particle of mass 3 kg hangs in equilibrium on a light string inclined at α to the vertical, held by a horizontal force P N, as shown. $\tan\alpha = \frac{3}{4}$. Take $g = 9.8$ m s^{-2}. Find the tension in the string and the value of P. 	
4 A sequence is defined by $u_{n+1} = k u_n + 2$, $u_1 = 2$. Given that $u_3 = 14$, find the possible values of k.	
5 A uniform rod AB of length 8 m and mass 20 kg hangs horizontally from two vertical strings attached 1.5 m from A and 1.5 m from B. A particle of mass 4 kg is attached 2 m from A. Take $g = 9.8$ m s^{-2}. Find the tension in each string.	

Day 89	A Level Maths: B Tier 10-a-day

6 A curve has equation $xe^y + 2y = -1$.
Find $\frac{dy}{dx}$ in terms of x and y, and the gradient at $(-1, 0)$.

7 A bag has 4 green and 5 yellow beads; two are taken without replacement.
(a) Find P(exactly one green).
(b) Find P(at least one green).

8 A curve has parametric equations $x = 3t + 2$, $y = 2t^2 + 7t + 4$.
The line $y = x + 8$ meets the curve at two points.
Find the coordinates of these points.

9 $f(x) = \ln x + x - 4$. Use the Newton-Raphson method with
$x_0 = 3$ to find x_1 and x_2, to 4 d.p.

10 The scatter diagram shows eight pairs of values of x and y.
(a) Describe the correlation.
(b) Why should $y = 16 - x$ not be used for $x = 14$?

