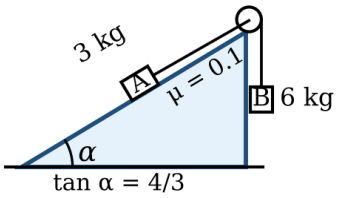
Day 41	A Level Maths: A Tier 10-a-day
1 The system is released from rest and A moves up the rough plane. Find (a) the acceleration, (b) the tension in the light string. Take g = 9.8. Give answers to 3 s.f. if not exact. 	
2 Solve $2\cos^2\theta + 3\sin\theta - 3 = 0$ for $0° \leq \theta \leq 360°$.	
3 The 110 items in a list are numbered 1 to 110. A systematic sample of 11 items is taken, starting with a random item among the first few. The first item selected is number 8. Find the sampling interval and the number of the last item selected.	
4 A curve has parametric equations $x = t - 3$, $y = -2t^2 - 5$. Find a Cartesian equation of the curve in the form y = f(x).	
5 $y = x^2 \ln x$ for $x > 0$. Find the exact coordinates of the stationary point and show that it is a minimum.	

Day 41	A Level Maths: A Tier 10-a-day
6 Particle A (10 kg) rests on a smooth table, joined by a light string over a smooth pulley at the edge to particle B (4 kg), hanging 2 m above the floor. Released from rest. Find (a) the tension, (b) the speed of B as it hits the floor. Take g = 9.8. Give answers to 3 s.f. if not exact.	
7 An arithmetic series has first term 5 and common difference 6. The sum of the first n terms is 1776. Find n.	
8 (a) Express $\frac{2x+6}{(x+1)^2}$ in the form $\frac{A}{x+1}+\frac{B}{(x+1)^2}$. (b) Hence find the exact value of $\int_0^4 \frac{2x+6}{(x+1)^2}\,dx$.	
9 X, the mass (g), is normally distributed with mean 61 and standard deviation 5. Find (a) P(X > 58.5) (b) P(58.5 < X < 68.5), each to 3 s.f.	
10 $f(x) = \frac{-2x+3}{(1-2x)(1+2x)}$. (a) Express f(x) in partial fractions. (b) Hence expand f(x) up to x^2. (c) State the range of x for which the expansion is valid.	