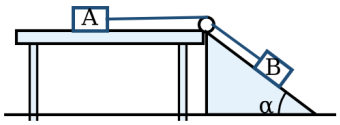
Day 10	A Level Maths: S Tier 10-a-day
1 Particle A (7 kg) lies on a rough table with $\mu = 0.2$, and is joined by a light string over a smooth pulley (see diagram) to particle B (9 kg) on a smooth slope, $\sin\alpha = \frac{3}{5}$. Released from rest, the string is cut when B has moved 3 m. Find the further distance A slides before stopping. 	
2 X takes values 2, 3, 4, 5 with $P(X = x) = k(7 - x)$. X_1 and X_2 are independent copies of X. (a) Find k. (b) Find $P(X_1 + X_2 = 6)$. (c) Find $P(X_1 = X_2)$ and $E(X_1 + X_2)$.	
3 A stone is thrown vertically upwards with speed 5 m s^{-1} from the top of a cliff. The top of the cliff is 146.4 m above the sea. Find (a) the time taken for the stone to reach the sea, (b) the total distance travelled by the stone, to 3 s.f. Take g = 9.8 m s^{-2}.	
4 25 recorded masses (grams) have mean 45 and standard deviation 6. One value was recorded as 63 but should have been 71. Find the correct mean and the correct standard deviation.	
5 Solve $\sqrt{5x + 11} = x - 5$.	

Day 10	A Level Maths: S Tier 10-a-day
6 Solve $2 \ln x = \ln(x + 12) + \ln 1$, stating clearly why one root is rejected.	
7 $u_{n+1} = u_n + 2n + 4$, $u_1 = 2$. (a) Show that $u_n = an^2 + bn + c$ and find a, b, c. (b) Find the least n for which $u_n > 1397$.	
8 Find the coordinates of the points of inflection of $y = \frac{6}{x^2 + 3}$.	
9 The curve C has parametric equations $x = t$, $y = 3t^2$. The line $y = 15x - 18$ meets C at A and B. Find the exact length AB.	
10 (a) Show that $\frac{1 - \cos 2\theta}{1 + \cos 2\theta} \equiv \tan^2\theta$. (b) Hence solve $\frac{1 - \cos 2\theta}{1 + \cos 2\theta} = \frac{1}{3}$ for $0 \leq \theta <$ 360° (1 d.p.).	