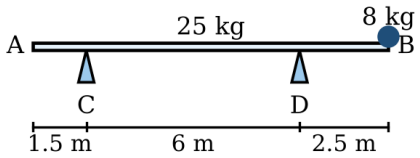
Day 233	A Level Maths: A Tier 10-a-day
1 Solve $2\cos^2\theta - \sin\theta - 2 = 0$ for $0° \leq \theta \leq 180°$.	
2 How many arrangements of the letters of the word ORDINAL have all the vowels next to each other?	
3 $f(x) = x^3 + 2x^2 - 9x - 4$. (a) Show that $(x + 4)$ is a factor of $f(x)$. (b) Solve $f(x) = 0$, giving surds in simplest form.	
4 A uniform beam AB rests on supports at C and D, with a particle attached at B. Find the reactions at C and D. Take g = 9.8. Give answers to 3 s.f. if not exact. 	
5 A geometric sequence has first term 100 and common ratio $\frac{9}{10}$. Find the first term of the sequence that is less than 1.	

Day 233	A Level Maths: A Tier 10-a-day
6 Find the coordinates of the stationary points of $y = \frac{x^2 + 21}{x + 2}$.	
7 A particle P has position vector $\mathbf{r} = (t^3 + 4t)\mathbf{i} + (4t^2 - 8t)\mathbf{j}$ metres at time t s. Find (a) the speed of P when t = 3, (b) the value of t when P is moving parallel to $\mathbf{i}$. Give answers to 3 s.f. if not exact.	
8 Of 33 students, 18 study Maths (M), 15 Physics (P) and 8 Chemistry (C). 8 study M and P, 3 study M and C, 4 study P and C, and 2 study all three. One student is chosen at random. Given that a student does not study Maths, find the probability that they study Physics.	
9 Solve $2\sec^2 x + \tan x - 8 = 0$ for $0° \leq x \leq 180°$. Give answers to 1 d.p.	
10 $f(x) = \frac{-7x + 1}{(1 - x)(1 + 2x)}$. (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.	