Day 185	A Level Maths: A Tier 10-a-day
1 The points A, B and C have coordinates $(-1, -2, 0)$, $(-1, 0, 1)$ and $(3, 4, 1)$. Find angle ABC, in degrees to 1 d.p.	
2 Summary statistics for the daily total rainfall (mm) in the same month are: Camborne: mean 28, standard deviation 1.5; Leeming: mean 6, standard deviation 3.1. Make two comparisons.	
3 Solve $\|3x - 3\| = \|2x - 7\|$.	
4 How many arrangements of the letters of the word CRAYONS have all the vowels next to each other?	
5 A crate of mass 15 kg is pulled at constant speed along rough horizontal ground, $\mu = 0.3$, by a force of P N at angle θ above the horizontal, $\tan\theta = \frac{5}{12}$. Find P and the normal reaction. Take g = 9.8. Give answers to 3 s.f. if not exact.	

Day 185 **A Level Maths: A Tier 10-a-day**

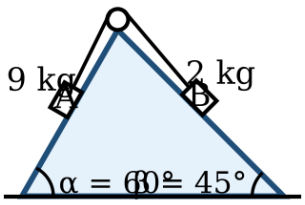
6 Prove the identity

$$\frac{1}{1-\sin x}+\frac{1}{1+\sin x}\equiv 2\sec^2 x$$

7 The line $-3x + 4y = k$ is a tangent to the circle $(x-3)^2 + (y-2)^2 = 9$.
Find the two possible values of k.

8 A curve has parametric equations $x = 2\sin t$, $y = 5\cos 2t$.
Find $\frac{dy}{dx}$ in terms of t and the exact equation of the tangent at the point where $t = \frac{\pi}{3}$, in the form $y = mx + c$.

9 The system is released from rest. Find (a) the magnitude of the acceleration and which particle moves down, (b) the tension. Take g = 9.8. Give answers to 3 s.f. if not exact.



10 Solve $x(\sqrt{3}-1) = 1 - 4\sqrt{3}$, writing x in the form $p + q\sqrt{3}$.