Day 361 **A Level Maths: A Tier 10-a-day**

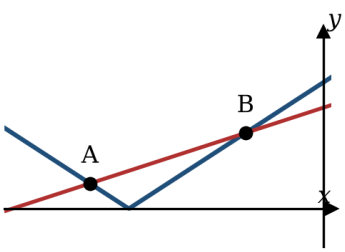
1 The 5th term of an arithmetic sequence is -29 and the 11th term is -65.
Find the first term and common difference, and the sum of the first 12 terms.

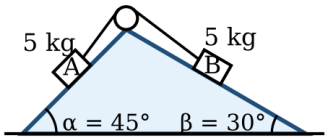
2 A stratified sample of 80 people is taken from three groups.
10 of the sample are from Sales, which has 200 people.
(a) Find the total number of people.
(b) Admin has 240 people. How many are sampled?

3 A 2 kg particle rests on a rough plane inclined at α, $\tan\alpha = \frac{8}{15}$, $\mu = 0.1$. A force of P N acts up a line of greatest slope and the particle stays at rest. Find the range of values of P.
Take g = 9.8. Give answers to 3 s.f. if not exact.

4 X is normally distributed with mean 39 and standard deviation σ.
Given that $P(X > 47) = 0.1587$, find σ to 3 significant figures.

5 The diagram shows the graphs of $y = |x + 5|$ and $y = \frac{1}{2}x + 4$.
The graphs meet at A and B.
Find the coordinates of A and B.



Day 361	A Level Maths: A Tier 10-a-day
6 Water pours into a cone, vertex down, at 40 cm^3s^{-1}. The surface radius is always $\frac{h}{2}$. Find the rate at which the depth is rising when h = 5 cm.	
7 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. 	
8 Solve $3\text{cosec}^2 x - 9\cot x + 3 = 0$ for $0° < x < 360°$. Give answers to 1 d.p.	
9 Solve $x(\sqrt{6} - 2) = 2 - 3\sqrt{6}$, writing x in the form $p + q\sqrt{6}$.	
10 Use the substitution $u = x^2 + 1$ to find the exact value of $\int_0^1 x(x^2 + 1)^3 \, dx$.	