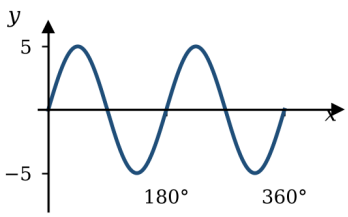
Day 80	A Level Maths: C Tier 10-a-day

1 A and B are mutually exclusive, with P(A) = 0.1 and P(B) = 0.45.
(a) Find P(A ∪ B).
(b) Find the probability that neither A nor B happens.

2 The diagram shows the graph of y = a sin bx for 0° ≤ x ≤ 360°, where a and b are positive integers.
Find a and b.



3 A ball is dropped from rest from the top of a tower of height 78.4 m. Take g = 9.8 m s^{-2} and ignore air resistance. Find (a) the time taken to reach the ground, (b) its speed on hitting the ground.

4 A geometric sequence has first term 5 and common ratio 3. Find the first term that exceeds 10000.

5 A systematic sample of 15 patients is taken from a numbered list of 225.
The first one selected is number 15. Find the number of the 5th one selected.

Day 80	A Level Maths: C Tier 10-a-day
6 Express $\frac{-4x-13}{(x+4)(x+1)}$ in the form $\frac{A}{x+4}+\frac{B}{x+1}$. Find the values of A and B.	
7 An arithmetic series has first term 9 and common difference 2. Find the smallest n for which the sum of the first n terms exceeds 800.	
8 A particle moves in a straight line. Its velocity at time t seconds ($0 \leq t \leq 6$) is $v = (-3t^2 + 18t)$ m s^{-1}. Find the maximum velocity and the time at which it occurs.	
9 Prove by contradiction that there are no integers x and y such that $15x + 5y = 104$.	
10 $\frac{-x-5}{(x+4)(x+3)} \equiv \frac{A}{x+4}+\frac{B}{x+3}$. Find A and B, and hence find $\int \frac{-x-5}{(x+4)(x+3)}\,dx$.	