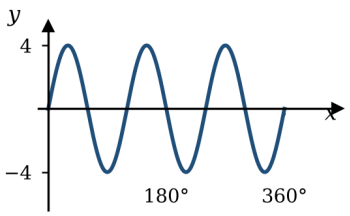
Day 268 **A Level Maths: C Tier 10-a-day**

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



2 A particle has initial velocity $(6\mathbf{i})$ m s^{-1} and constant acceleration $(3\mathbf{i} + 2\mathbf{j})$ m s^{-2}.
Find its velocity after 3 s.

3 10 pairs of data on hours of revision and test score have $r = -0.4$.
Test, at the 5% significance level, for evidence of negative correlation. The critical value is -0.5494.

4 Solve the simultaneous equations:
$y = x^2 - x - 9$, $y = -x - 5$.

5 A ball is projected from level ground with velocity $(8\mathbf{i} + 39.2\mathbf{j})$ m s^{-1} ($\mathbf{i}$ horizontal, $\mathbf{j}$ vertically up). Take g = 9.8 m s^{-2}.
(a) Find the time of flight.
(b) Find the greatest height reached.

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6 A population is N(μ, 5^2). H_0: $\mu = 110$, H_1: $\mu > 110$. A sample of 9 has mean $\bar{x} = 113.67$. Test at the 5% level. Critical value: $z = 1.645$.	
7 The line $y = -x + k$ is a tangent to the curve $y = x^2 + 5x - 4$. Find the value of k.	
8 $\frac{-x-5}{(x+3)(x+1)} \equiv \frac{A}{x+3} + \frac{B}{x+1}$. Find A and B, and hence find $\int \frac{-x-5}{(x+3)(x+1)}\,dx$.	
9 A is $(-4, 1)$ and B is $(6, 7)$. AB is a diameter of a circle. Find the equation of the circle.	
10 Solve $\log_x 16 = 4$.	