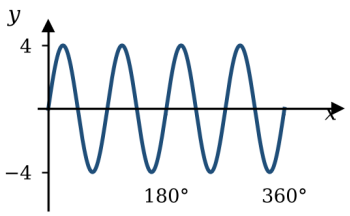
Day 310	A Level Maths: C Tier 10-a-day

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.

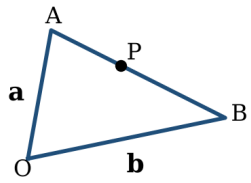


2 Expand and simplify $(7 + \sqrt{7})(7 - \sqrt{7})$.

3 A crate of mass 15 kg is pulled along rough horizontal ground at constant speed by a horizontal force of 36.75 N. Take $g = 9.8$ m s^{-2}.
Find the coefficient of friction between the crate and ground.

4 Use the substitution $u = x^2 + 1$ to find
$\int \frac{3x}{x^2 + 1} \, dx$.

5 $X \sim N(115, 5^2)$. Given that $P(X < a) = 0.1$, find a to 3 s.f.

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6 The circle $(x + 4)^2 + (y + 4)^2 = 13$ passes through P$(-6, -7)$. Find the gradient of the tangent to the circle at P.	
7 Seeds are planted one at a time until one grows, with probability 0.3 each time. X is the number planted. Find $P(X \leq 4)$, to 3 s.f.	
8 In the diagram, OA = $\mathbf{a}$, OB = $\mathbf{b}$, and P lies on AB with AP : PB = 2 : 3. Find AB and AP in terms of $\mathbf{a}$ and $\mathbf{b}$. 	
9 A geometric series has common ratio $\frac{3}{4}$ and sum to infinity 40. Find the first term.	
10 A rocket is projected vertically upwards with speed 7 m s^{-1} from ground level. Taking g = 9.8 m s^{-2}, find the maximum height it reaches above the ground.	