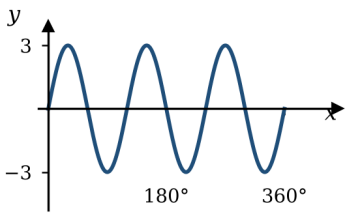
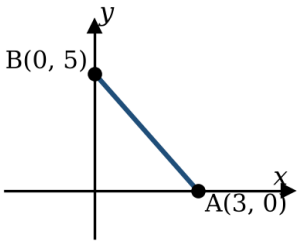
Day 229 **A Level Maths: C Tier 10-a-day**

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 The diagram shows a line meeting the axes at A and B.
Find (a) the equation of AB in the form $px + qy = r$ with integers p, q and r, (b) the length AB.



3 $\mathbf{a} = \begin{pmatrix} 5 \\ 2 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -15 \\ -6 \end{pmatrix}$.
Show that a and b are parallel and find the ratio $|\mathbf{b}| : |\mathbf{a}|$.

4 A car of mass 1000 kg is driven along a straight horizontal road by a driving force of 1800 N against a constant resistance of 300 N.
Find the acceleration of the car.

5 Find the exact value of

$$\int_0^2 2\,e^{3x}\,dx.$$

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6 Find the set of values of k for which $x^2 + kx + 49 = 0$ has two distinct real roots.	
7 Car P passes a point O at constant speed 8 m s^{-1}. At that instant car Q starts from rest at O with constant acceleration 4 m s^{-2} in the same direction. Find the time when Q catches up P.	
8 X ~ B(9, 0.3). Find P(X ≥ 4), giving your answer to 3 s.f.	
9 Solve $x^2 - 2x - 2 = 0$, giving your answers in the form $p \pm \sqrt{q}$.	
10 The diagram shows the density of X ~ N(135, 8^2). a and b are equal distances from the mean. The shaded area is 0.84. Find P(X > b). 