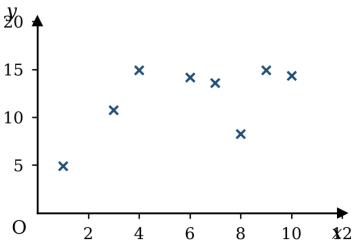
Day 272 **A Level Maths: B Tier 10-a-day**

1 Solve $4\cos^2 x + 3 - 7\cos x = 0$ for $0 \leq x \leq 360°$,
giving answers to 1 d.p. where necessary.

2 The scatter diagram shows eight pairs of values of x and y.
(a) Describe the correlation.
(b) Why should $y = 4 + x$ not be used for $x = 15$?



3 Find the sum of all the multiples of 7 that lie between 139 and 442.

4 A cyclist travelling at 20 m s^{-1} brakes and comes to rest with constant deceleration 2.5 m s^{-2}.
Find (a) the distance travelled while braking, (b) the time taken to stop.

5 Points A, B and C have position vectors $\begin{pmatrix}3\\3\\2\end{pmatrix}$, $\begin{pmatrix}0\\6\\1\end{pmatrix}$ and $\begin{pmatrix}-6\\12\\r\end{pmatrix}$ respectively.
Given that A, B, C are collinear, find r.

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6 Find the coefficient of x^2 in the expansion of $(3 - x)(1 + 3x)^5$.	
7 Solve $2\tan^2 x + 9\sec x + 11 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p.	
8 Show that the equation $3x^2 + 5x + 12 = 0$ has no real roots.	
9 Particles A (4 kg) and B (6 kg) are joined by a light string over a smooth pulley. Both are held with the string taut, B is 0.5 m above the ground, then released. Take $g = 9.8$ m s^{-2}. Find the speed with which B hits the ground.	
10 A class of width 10, frequency 40, is a bar 5 cm wide, 2 cm tall. (a) Find the bar height for width 10, frequency 24. (b) Find the frequency of a 1 cm by 3 cm bar.	