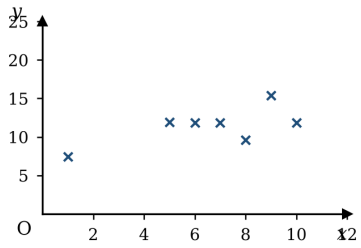
Day 324 **A Level Maths: B Tier 10-a-day**

1 The scatter diagram shows eight pairs of values of x and y.
(a) Describe the correlation.
(b) Why should y = 5 + x not be used for x = 15?



2 A particle has velocity $(-4\mathbf{i} + \mathbf{j})$ m s^{-1} at time t = 0 and moves with constant acceleration $(4\mathbf{i} + 2\mathbf{j})$ m s^{-2}.
Find its velocity and speed when t = 4.

3 Solve $2x^2 - 2x - 4 \geq 0$.

4 For 9 pairs of values, $\bar{x} = 10$, $\bar{y} = 18$, $S_{xx} = 20$ and $S_{xy} = 50$.
(a) Find the regression line of y on x in the form y = a + bx.
(b) Estimate y when x = 14.

5 Given that $\tan\theta = -\frac{3}{4}$ and $90° < \theta < 180°$, find the exact value of $\tan 2\theta$.

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6 Solve $\|2x - 1\| = \|-4x - 3\|$.	
7 (a) Write $\frac{-x - 1}{(x + 3)(x + 5)}$ in partial fractions. (b) Hence evaluate $\int_0^2 \frac{-x - 1}{(x + 3)(x + 5)}\,dx$, giving the answer as a single logarithm.	
8 Prove by contradiction that there are no integers m and n such that $21m + 35n = 142$.	
9 Particles A (3 kg) and B (9 kg) are joined by a light string over a smooth pulley. Both are held with the string taut, B is 1.25 m above the ground, then released. Take $g = 9.8$ m s^{-2}. Find the speed with which B hits the ground.	
10 Given that $\sin A = \frac{8}{17}$ and $\sin B = \frac{5}{13}$, where A and B are acute, find the exact value of $\sin(A + B)$.	