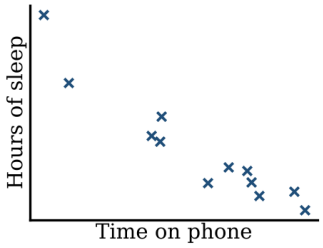
Day 269 **A Level Maths: C Tier 10-a-day**

1 The scatter diagram shows time on phone and hours of sleep for a group.
Describe the correlation.



2 The velocity of a boat is $(-8\mathbf{i} + 15\mathbf{j})$ m s^{-1}, where $\mathbf{i}$ and $\mathbf{j}$ are perpendicular unit vectors.
(a) Find the speed.
(b) Find the acute angle between the direction of motion and the line of $\mathbf{i}$. Give 1 d.p.

3 The vector $\mathbf{p} = -24\mathbf{i} + 7\mathbf{j}$.
Find (a) $|\mathbf{p}|$, (b) the angle p makes with the positive x-axis, measured anticlockwise (1 d.p.).

4 $f(x) = \frac{1}{x+1} - 2$, $x \neq -1$.
Find the range of f.

5 Solve $\tan x = -\sqrt{3}$ for $0 \leq x \leq 2\pi$.
Give your answers in terms of π.

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6 Seeds are planted one at a time until one grows, with probability 0.5 each time. X is the number planted. Find $P(X \leq 6)$, to 3 s.f.	
7 $(x + 2)$ is a factor of $x^3 + kx^2 + 6x + 4$. Find the value of k.	
8 Two forces $(-\mathbf{i})$ N and $(4\mathbf{i} - 6\mathbf{j})$ N act on a particle of mass 3 kg. No other horizontal forces act. Find the acceleration of the particle as a vector in terms of $\mathbf{i}$ and $\mathbf{j}$.	
9 Solve $6x + 1 \geq 4x - 7$.	
10 A$(-1, 3)$, B$(5, 0)$ and C$(9, -2)$. Show that A, B and C are collinear and find AB : BC.	