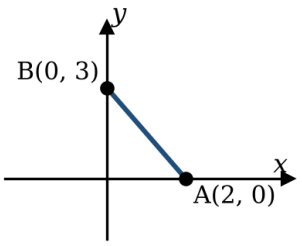
Day 271 **A Level Maths: C Tier 10-a-day**

1 The discrete random variable X has P(X = x) = k(x^2 + 2) for x = 0, 1, 2, 3.
(a) Find the value of k.
(b) Find P(X ≥ 1).

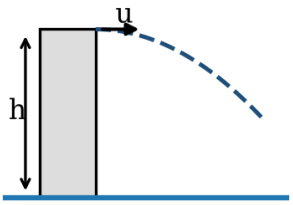
2 The diagram shows a line meeting the axes at A and B.
Find (a) the equation of AB in the form px + qy = r with integers p, q and r, (b) the length AB.



3 A train starts from rest and accelerates uniformly at 1 m s^{-2} for 6 s, then travels at constant speed for a further 20 s. Find the total distance travelled.

4 8 pairs of data on height and arm span have r = 0.47.
Test, at the 5% significance level, for evidence of positive correlation. The critical value is 0.6215.

5 $x_{n+1} = \sqrt{5x_n + 2}$, with $x_0 = 2$.
Find x_1, x_2 and x_3 to 3 decimal places.

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6 Find the sum of the first 6 terms of the geometric series 4 + 8 + 16 + ...	
7 Solve $\sin(x - 20°) = \frac{\sqrt{2}}{2}$ for $0° \leq x \leq 360°$.	
8 A ball is thrown horizontally at 9 m s^{-1} from the top of a vertical cliff of height 44.1 m above the sea. Take g = 9.8 m s^{-2}. Find (a) the time taken to reach the sea, (b) the horizontal distance of the landing point from the cliff. 	
9 A curve has equation $x^2 + y^2 = 25$. Find dy/dx in terms of x and y, and hence the gradient at (−3, 4).	
10 Simplify $(2x)^3 \div 2x^3$.	