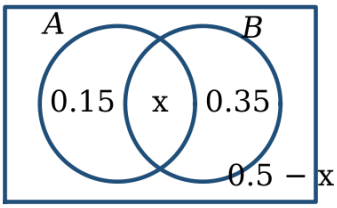
Day 132	A Level Maths: S Tier 10-a-day
1 $f(x) = x^3 - 1$. Show that $(x - 1)$ is a factor of f(x), and that the equation f(x) = 0 has exactly one real root.	
2 The Venn diagram shows probabilities; A and B are independent. Find the possible values of x. 	
3 Solve $8\sec^2\theta + 14\tan\theta - 12 = 0$ for $0 \leq \theta < 360°$, giving answers to 1 d.p.	
4 Find the coefficient of x^3 in the expansion of $(2x + 1)(1 - 3x)^7$.	
5 A stone is projected from level ground with horizontal and vertical velocity components 24.5 and 29.4 m s^{-1}. Find (a) the two times at which it moves at 45° to the horizontal, (b) the horizontal distance between those two points. Take g = 9.8 m s^{-2}.	

Day 132	A Level Maths: S Tier 10-a-day
6 Sam claims that $n^2 + n + 5$ is prime for every positive integer n. Show that Sam is wrong by finding the smallest value of n that is a counter-example.	
7 The curves $y = e^x$ and $y = 36\,e^{-x}$ meet at the point P. Find the exact area of the region bounded by the two curves and the y-axis.	
8 $y = e^x \cos 2x$. Show that $dy/dx = e^x(\cos 2x - 2 \sin 2x)$. Find the x coordinate of the stationary point with the smallest positive x (3 s.f.), and its nature.	
9 The number of customers arriving at a shop in one hour is Po(16). Use a suitable approximation to find $P(X \geq 24)$, to 3 significant figures.	
10 A ball is projected from a point O on horizontal ground at 45° to the horizontal. The ball just passes over the top of a vertical wall of height 34.8 m, at a horizontal distance of 74 m from O. Find (a) the speed of projection, (b) the greatest height of the ball above the ground, to 3 s.f. Take $g = 9.8$ m s^{-2}.	