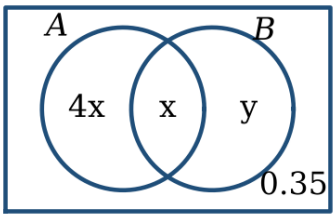
Day 302	A Level Maths: S Tier 10-a-day
1 Solve $\lvert -2x - 6\rvert < \lvert 3x - 6\rvert$.	
2 £8000 is invested at 4% per year compound interest. Find the least whole number of years for the investment to exceed £16000.	
3 The curve $y = x^2 - 5x + 2$ is translated by $\begin{pmatrix} 2 \\ -1 \end{pmatrix}$ and then a stretch, scale factor $\frac{1}{2}$, parallel to the x-axis. Find the equation of the resulting curve in the form $y = ax^2 + bx + c$.	
4 The lengths of a component, in mm are modelled by $N(85, \sigma^2)$. The probability of a value above 94 is 0.15. (a) Find σ. (b) Find the probability of a value above 104.	
5 A car of mass 1500 kg tows a trailer of mass 600 kg along a horizontal road, with driving force 1470 N. Resistances are 600 N on the car and 450 N on the trailer. (a) Find the tension in the tow bar. At 6 m s^{-1} the tow bar breaks. (b) Find the distance between car and trailer when the trailer stops.	

Day 302	A Level Maths: S Tier 10-a-day
6 The tangent to $y = \frac{24}{x^2 + 3}$ at the point where $x = 1$ meets the axes at A and B. Find the exact area of triangle OAB, where O is the origin.	
7 The function f is defined by $f(x) = 2x^2 - 12x + 19$ for $x \geq k$. Given that k is the least value for which f is one-one, find k, $f^{-1}(x)$, and the domain of f^{-1}.	
8 The Venn diagram shows probabilities; A and B are independent. Find x and y. 	
9 The points A, B, C have coordinates (5, −2, 1), (0, −2, −1), (4, 1, 5). Find angle ABC to 1 d.p., and the exact area of triangle ABC.	
10 Two ships A and B move with constant velocities. At time t = 0 hours, A is at $(\mathbf{i} - 6\mathbf{j})$ km relative to a fixed origin and B is at $(-14\mathbf{i} - 11\mathbf{j})$ km. A has velocity $(\mathbf{i} + 5\mathbf{j})$ km h^{-1} and B has velocity $(5\mathbf{i} + 8\mathbf{j})$ km h^{-1}. Find (a) the time at which the ships are closest together, (b) the least distance between them.	