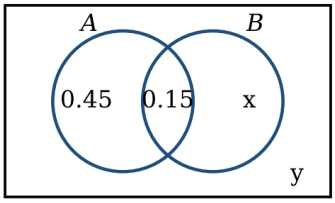
Day 195	A Level Maths: B Tier 10-a-day
1 A van of mass 1500 kg moves along a straight horizontal road. The engine produces a driving force of 1800 N and the resistance to motion is 300 N. Find the acceleration of the van.	
2 Given that $y = (2x - 4)^6$, find $\frac{dy}{dx}$, and the gradient of the curve when $x = 3$.	
3 Describe the single transformation that maps the graph of $y = f(x)$ onto the graph of: (a) $y = f(-x)$ (b) $y = f(x) - 1$ (c) $y = 4f(x)$	
4 $X \sim Po(0.5)$, modelling the number of calls to a helpline per minute. Find, to 3 significant figures, (a) $P(X \leq 2)$ (b) $P(X = 2)$	
5 £1000 is invested at 4% compound interest per year. Find the least whole number of years for the investment to exceed £5000.	

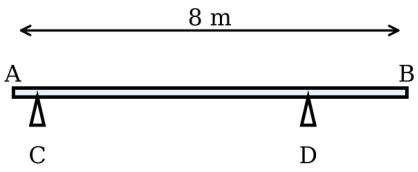
Day 195 **A Level Maths: B Tier 10-a-day**

6 The Venn diagram shows probabilities for events A and B, which are independent.
Find the values of x and y.



7 Given that $2\cos\theta + 3\sin\theta \equiv \sqrt{13}\cos(\theta - 56.3°)$,
solve $2\cos\theta + 3\sin\theta = 3$ for $0 \leq \theta \leq 360°$. (1 d.p.)

8 A uniform plank AB of length 8 m and mass 20 kg rests horizontally on supports at C and D, where AC = 0.5 m and DB = 2 m.
A girl of mass 20 kg walks from D towards B.
Find how far she is from D when the plank is about to tilt.



9 Express $\frac{12}{2-\sqrt{5}}$ in the form $p + q\sqrt{5}$, where p and q are integers.

10 A curve has parametric equations $x = 4t^2$, $y = 3t$, $t \in \mathbb{R}$.
Find a Cartesian equation of the curve.