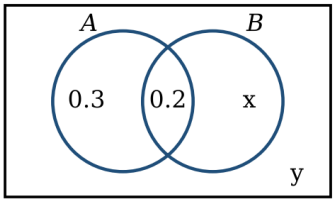
Day 364	A Level Maths: B Tier 10-a-day
1 A battery lasts X hours, normal with mean 20, s.d. 6. Find, to 3 s.f., the probability a value is (a) more than 26, (b) between 26 and 29.	
2 Solve $1.5^x = 19$, giving your answer to 3 s.f.	
3 Describe the single transformation that maps the graph of y = f(x) onto the graph of: (a) $y = f(x - 3)$ (b) $y = f(x) + 1$ (c) $y = f(\frac{x}{4})$	
4 Given that $y = \frac{5x^2 + 3}{x + 5}$, find $\frac{dy}{dx}$, and its value when x = 1.	
5 A radio-controlled car moves with constant velocity $(2\mathbf{i} - 2\mathbf{j})$ m s^{-1}. At time t = 0 its position vector relative to a fixed origin O is $(8\mathbf{i} + 8\mathbf{j})$ m. Find (a) its position vector when t = 5, (b) the value of t when it crosses the line through O in the direction of $\mathbf{i}$.	

Day 364 **A Level Maths: B Tier 10-a-day**

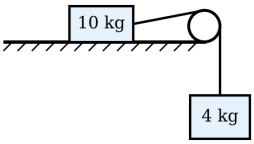
6 The Venn diagram shows probabilities for events A and B, which are independent.
Find the values of x and y.



7 $\mathbf{a} = \begin{pmatrix} -4 \\ 3 \\ 4 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -4 \\ 3 \\ 1 \end{pmatrix}$.
Find the angle between a and b, to 1 d.p.

8 Find the coefficient of x^3 in the expansion of $(1 + 4x)(1 + 2x)^5$.

9 A block of mass 10 kg lies on a rough horizontal table (coefficient of friction 0.3). It is joined by a light string over a smooth pulley to a particle of mass 4 kg hanging freely.
Take $g = 9.8\ \text{m s}^{-2}$.
The system is released. Find the acceleration and the tension in the string.



10 A salary starts at £25000 in year 1 and increases by 4% each year.
Find the total salary earned in the first 7 years, to the nearest pound.