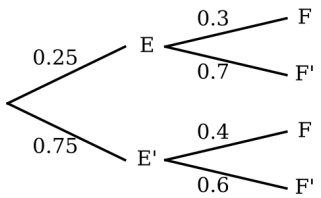
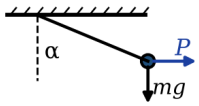
Day 170	A Level Maths: B Tier 10-a-day
1 The first term of an arithmetic series is 12 and the common difference is 5. The sum of the first n terms is 345. Find the value of n.	
2 A box of mass 5 kg rests on a rough horizontal floor, with coefficient of friction 0.4. A horizontal force of 16 N is applied to the box. Take $g = 9.8$ m s^{-2}. Determine whether the box moves. Find the friction force, or the acceleration if it moves.	
3 The tree diagram shows probabilities for event E, followed by event F. Find the probability that exactly one of E and F occurs. 	
4 Evaluate $\sum_{r=7}^{17}(5r + 3)$.	
5 (a) Write $2\cos\theta + 3\sin\theta$ in the form $R\cos(\theta - \alpha)$, with $R > 0$ and $0 < \alpha < 90°$. (b) Hence find its maximum value and the smallest $\theta \geq 0$ at which it occurs. Give α to 1 d.p.	

Day 170	A Level Maths: B Tier 10-a-day
6 Find the coefficient of x^2 in the expansion of $(2 + 3x)(2 + x)^5$.	
7 Given that each attempt at a task succeeds independently with probability 0.4, find the least number of attempts needed for the probability of at least one success to exceed 0.95.	
8 A particle of mass 2 kg hangs in equilibrium on a light string inclined at α to the vertical, held by a horizontal force P N, as shown. $\tan\alpha = \frac{12}{5}$. Take $g = 9.8$ m s^{-2}. Find the tension in the string and the value of P. 	
9 Solve $\cos 2x + 3\cos x = 1$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.	
10 The function $f(x) = e^x - 7x$. Show that $f(x) = 0$ has a root between $x = 3$ and $x = 3.5$.	