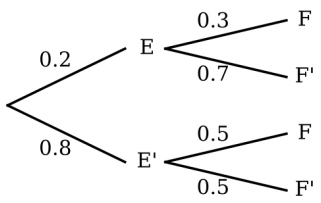
Day 19	A Level Maths: B Tier 10-a-day
1 Find the set of values of x for which $5x - 1 \geq -7$ and $x^2 + 6x + 5 \geq 0$.	
2 A car of mass 1200 kg moves along a horizontal road. The engine works at a constant rate of 48 kW. The resistance to motion is constant at 600 N. Find the acceleration when the speed is 16 m s^{-1}.	
3 The length X cm of a metal rod is normal with mean 250, s.d. 10. Find k (3 s.f.): (a) P(X < k) = 0.2, (b) P(X > k) = 0.01.	
4 Line l_1 has equation $4x - 3y = 20$ and line l_2 has equation $4x - 5y = 28$. The lines meet at P. Find the area of the triangle formed by l_1, l_2 and the x-axis.	
5 The tree diagram shows probabilities for event E, followed by event F. Find the probability that exactly one of E and F occurs. 	

Day 19 **A Level Maths: B Tier 10-a-day**

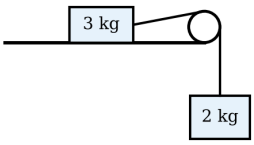
6 The function $f(x) = 2\cos x - \frac{3}{2}x$.

Show that $f(x) = 0$ has a root between $x = 0.5$ and $x = 1$ (x in radians).

7 A particle of mass 3 kg lies on a smooth horizontal table. It is attached by a light string over a smooth pulley at the edge of the table to a particle of mass 2 kg hanging freely.

Take $g = 9.8$ m s^{-2}.

The system is released from rest. Find the acceleration and the tension in the string.



8 A sequence is defined by $u_{n+1} = \frac{1}{1 - u_n}$, $u_1 = -2$.

(a) Show that the sequence is periodic, stating the period.

(b) Find u_{25} and $\sum_{r=1}^{25} u_r$.

9 Line l_1: $\mathbf{r} = \begin{pmatrix} -7 \\ -7 \\ 4 \end{pmatrix} + \lambda \begin{pmatrix} 2 \\ 2 \\ -1 \end{pmatrix}$.

Line l_2: $\mathbf{r} = \begin{pmatrix} -1 \\ -3 \\ 1 \end{pmatrix} + \mu \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$.

Show that l_1 and l_2 intersect and find the point.

10 Simplify $\frac{\sin 4x}{\sin 2x}$,

giving your answer as a single trigonometric term.