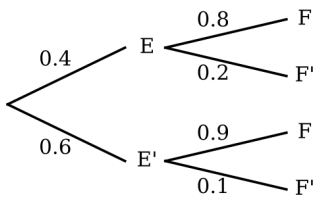
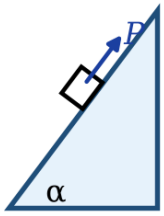
Day 132	A Level Maths: B Tier 10-a-day
1 P(A) = 0.6, P(B) = 0.2, P(A ∩ B) = 0.1. Find (a) P(A ∪ B), (b) P(A | B). (c) Are A and B independent?	
2 A coin is dropped from rest from a bridge, 44.1 m above the ground. Take g = 9.8 m s^{-2}. Find (a) the time taken to reach the ground, (b) its speed on landing.	
3 f(x) = −3x − 6 and g(x) = x^2 − 5 for x ∈ ℝ. (a) Find fg(x). (b) Solve gf(x) = 31.	
4 The tree diagram shows probabilities for event E, followed by event F. Find the probability that exactly one of E and F occurs. 	
5 The radius of a circular oil slick increases at 1.5 cm per second. Find the rate at which its area is increasing when r = 5 cm, in terms of π.	

Day 132 **A Level Maths: B Tier 10-a-day**

6 Line l_1 has equation $3x - 7y = -3$ and line l_2 has equation $x - 4y = -6$.
The lines meet at P. Find the area of the triangle formed by l_1, l_2 and the x-axis.

7 A block of mass 5 kg is held on a rough plane ($\tan\alpha = \frac{4}{3}$, $\mu = 0.25$) by a force P N up the plane, as shown.
Take $g = 9.8$ m s^{-2}. The block is about to move up the plane. Find P.



8 A curve has parametric equations $x = t + 1$, $y = -t^2 - 4t - 5$, $t \in \mathbb{R}$.
Find a Cartesian equation of the curve in the form $y = f(x)$.

9 The mass M kg of a substance satisfies $\frac{dM}{dt} = -0.2M$, where t is in years.
Initially $M = 50$. Find M when $t = 10$, and the half-life, each to 3 s.f.

10 (a) Write $\frac{2x + 4}{(x + 1)(x + 3)}$ in partial fractions.

(b) Hence evaluate $\int_0^4 \frac{2x + 4}{(x + 1)(x + 3)}\,dx$, giving the answer as a single logarithm.