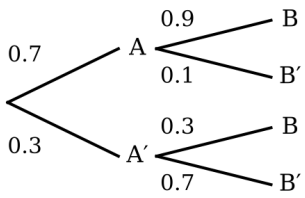
Day 153	A Level Maths: A Tier 10-a-day
1 The points A, B and C have coordinates (2, 5, 0), (−3, 0, 4) and (−2, 0, 2). Find angle ABC, in degrees to 1 d.p.	
2 A cyclist passes P with speed 3 m s^{-1} and accelerates uniformly. She travels 160 m in the next 20 s, reaching Q. Find (a) her acceleration, (b) her speed at Q, (c) her speed at the midpoint of PQ. Give answers to 3 s.f. if not exact.	
3 Solve $2\sin^2\theta - 2\cos\theta - 2 = 0$ for $0° \leq \theta \leq 360°$.	
4 A curve has parametric equations $x = 4 + 4\cos\theta$, $y = -2 + 4\sin\theta$. Find its Cartesian equation and describe the curve.	
5 θ is obtuse and $\sin\theta = \frac{5}{13}$. Find the exact values of $\sin 2\theta$, $\cos 2\theta$ and $\tan 2\theta$.	

Day 153 **A Level Maths: A Tier 10-a-day**

6 The tree diagram shows probabilities for events A and B.
(a) Find P(B′).
(b) Find P(A′ | B′).



7 A particle P moves on the x-axis with velocity $v = (6t^2 - 48t + 90)$ m s^{-1} at time t s, $t \geq 0$, and starts at O. Find (a) the times when P is at instantaneous rest, (b) the total distance P travels in the first 7 s.

8 Solve $x(\sqrt{6} - 1) = 3 + \sqrt{6}$, writing x in the form $p + q\sqrt{6}$.

9 $u_1 = 0$ and $u_{n+1} = \frac{1}{4} u_n + 6$.
(a) Find the limit L of the sequence as $n \to \infty$.
(b) Find the least n for which $|u_n - L| < 0.001$.

10 X, the length (mm), is normally distributed with mean 80 and standard deviation 2.
Find (a) P(X > 77) (b) P(77 < X < 78), each to 3 s.f.