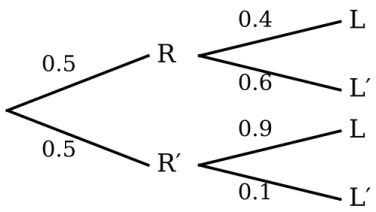
Day 341 **A Level Maths: C Tier 10-a-day**

1 The velocity of a boat is $(-4\mathbf{i} + 3\mathbf{j})$ m s^{-1}, where $\mathbf{i}$ and $\mathbf{j}$ are perpendicular unit vectors.
(a) Find the speed.
(b) Find the acute angle between the direction of motion and the line of $\mathbf{i}$. Give 1 d.p.

2 Simplify $(4x^4)^3 \div 16x$.

3 A particle moves in a straight line. Its velocity at time t seconds is v m s^{-1}, where $v = 3t^2 - 18t + 2$.
(a) Find its acceleration when $t = 3$.
(b) Find the time when its acceleration is zero.

4 The tree diagram shows probabilities for events R and L.
Find the probability that exactly one of R and L happens.



5 $y = x^3 - 3x^2$.
Find the coordinates of the stationary points and determine their nature.

Day 341	A Level Maths: C Tier 10-a-day
6 A curve has parametric equations $x = t + 3$, $y = 3t^2 - 4$. Find a Cartesian equation of the curve.	
7 The curve $y = ab^x$ passes through (0, 5) and (4, $\frac{5}{16}$). Find the values of a and b.	
8 The probability that a patient takes the drug is 0.2. If so, the probability that the patient recovers is 0.9; otherwise it is 0.1. Given that the patient recovers, find the probability that a patient takes the drug.	
9 Use integration by parts to find $\int x \sin x \, dx$.	
10 $f(x) = x^3 + x^2 - 22x - 40$ (a) Show that $(x + 2)$ is a factor of $f(x)$. (b) Factorise $f(x)$ completely.	