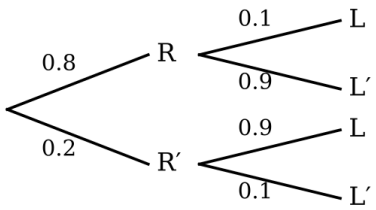
Day 251 **A Level Maths: C Tier 10-a-day**

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



2 $\mathrm{OA} = \begin{pmatrix} 2 \\ -3 \\ 3 \end{pmatrix}$ and $\mathrm{OB} = \begin{pmatrix} 10 \\ -2 \\ 7 \end{pmatrix}$.
Find AB and |AB|, and a unit vector in the direction of AB.

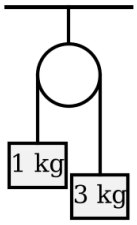
3 The curve $y = x^2 + 2x - 2$ is translated by the vector $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$.
Find the equation of the new curve, giving your answer in the form $y = ax^2 + bx + c$.

4 θ is acute and $\sin\theta = \frac{9}{41}$.
Find the exact values of $\cos\theta$ and $\tan\theta$.

5 $f(x) = \sqrt{x + 3} - 2$.
State the largest possible domain and the range of f.

Day 251 **A Level Maths: C Tier 10-a-day**

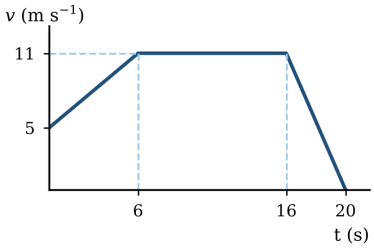
6 Two particles of masses 1 kg and 3 kg hang from the ends of a light inextensible string over a smooth pulley and are released from rest. Take g = 9.8 m s^{-2}. Find the acceleration and the tension in the string.



7 Find the sum of the first 9 terms of the geometric series 768 + 384 + 192 + ...

8 The vector p = 8**i** − 15**j**.
Find (a) |p|, (b) the angle p makes with the positive x-axis, measured anticlockwise (1 d.p.).

9 The graph shows the velocity of a cyclist.
(a) Find the acceleration in the first 6 s.
(b) Find the deceleration in the last 4 s.
(c) Find the total distance travelled.



10 A systematic sample of 15 students is taken from a numbered list of 165.
The first one selected is number 4. Find the number of the 9th one selected.