Day 4	A Level Maths: C Tier 10-a-day
1 Simplify $\sqrt{5} + \sqrt{180}$, giving your answer in the form $p\sqrt{5}$.	
2 A is acute and $\cos A = \frac{5}{13}$. Find the exact values of $\sin 2A$ and $\cos 2A$.	
3 A string pulls a box with a force of 16 N at an angle of 30° above the horizontal. Find the horizontal and vertical components of the force, to 3 s.f.	
4 The mean of 30 ages of the men is 67. The mean of 10 ages of the women is 59. Find the mean of all 40 values.	
5 A train starts from rest and accelerates uniformly at 1.5 m s^{-2} for 10 s, then travels at constant speed for a further 30 s. Find the total distance travelled.	

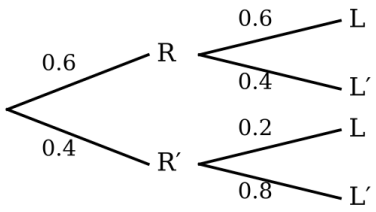
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6 Sketch $y = |3x - 3|$. Write down the coordinates of the vertex and of the point where the graph meets the y-axis.

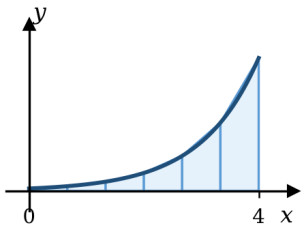
7 $\frac{-5x - 14}{(x + 4)(x + 2)} \equiv \frac{A}{x + 4} + \frac{B}{x + 2}$.

Find A and B, and hence find $\int \frac{-5x - 14}{(x + 4)(x + 2)}\, dx$.

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



9 The diagram shows the curve $y = e^x$ from x = 0 to x = 4 divided into 6 strips of equal width.
Use the trapezium rule with these strips to estimate the shaded area to 3 s.f.



10 Divide $f(x) = 2x^4 - 8x^3 + 2x^2 + 8x + 12$ by $(x - 3)$.
Find the quotient and the remainder.