Day 78	A Level Maths: B Tier 10-a-day

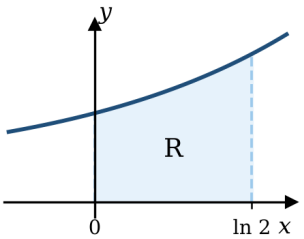
1 X ~ B(10, 0.7). Find, to 3 significant figures,
(a) $P(X \geq 7)$
(b) $P(X > 6)$

2 A sprinter moves in a straight line with constant acceleration. Its initial speed is 10 m s^{-1}, its final speed is 22 m s^{-1} and its acceleration is 1 m s^{-2}.
Find the time taken.

3 A car's value, £V, after t years is given by $V = 12000 \times 0.9^t$.
Find (a) the value after 3 years, (b) when it first falls below £3000, to 3 s.f.

4 A particle is in equilibrium under three forces: P N at angle θ above the positive x-axis, a force of 3 N in the negative x-direction and a force of Q N in the negative y-direction.
$\cos\theta = \frac{3}{5}$. Find P and Q.

5 The region R is bounded by the axes, the line $x = \ln 2$
and the curve $y = 2e^x + 1$. Find the exact area of R.



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6 A manufacturer claims that a proportion 0.4 of its sweets are red. A sample of 25 sweets has 7 red. Test, at the 10% level, whether the true proportion is lower than claimed.	
7 Express $\frac{12}{3+\sqrt{6}}$ in the form $p + q\sqrt{6}$, where p and q are integers.	
8 Find the x-coordinate(s) of the stationary point(s) of the curve $y = \frac{x}{x^2+4}$.	
9 Prove that $n^2 + 5n + 9$ is odd for all integers n.	
10 A curve has parametric equations $x = t - 1$, $y = 2t^2 + 4t - 1$. The line $y = -2x - 7$ meets the curve at two points. Find the coordinates of these points.	