Day 72	A Level Maths: C Tier 10-a-day
1 The curve $y = ab^x$ passes through (0, 6) and (2, $\frac{3}{2}$). Find the values of a and b.	
2 Find the remainder when $2x^3 + x^2 - 3x + 2$ is divided by $(2x - 1)$.	
3 $y = x^3 - 3x^2 + 2$. Find the coordinates of the stationary points and determine their nature.	
4 Solve $x^2 - 7x + 10 \geq 0$.	
5 Two forces $(7\mathbf{j})$ N and $(4\mathbf{i} - 5\mathbf{j})$ N act on a particle of mass 2 kg. No other horizontal forces act. Find the acceleration of the particle as a vector in terms of $\mathbf{i}$ and $\mathbf{j}$.	

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6 The probability that a machine is set up wrongly is 0.5. If so, the probability that an item is faulty is 0.4; otherwise it is 0.1. Given that an item is faulty, find the probability that a machine is set up wrongly.	
7 A lift of mass 500 kg is raised by a vertical cable with constant acceleration 0.75 m s^{-2} upwards. Take g = 9.8 m s^{-2}. Find the tension in the cable.	
8 X ~ B(100, 0.2). Use a normal approximation to find P(X ≤ 24), to 3 s.f.	
9 Find the set of values of k for which $x^2 + kx + 49 = 0$ has no real roots.	
10 $\mathbf{a} = 3\mathbf{i} - 3\mathbf{k}$ and $\mathbf{b} = -3\mathbf{i} + 2\mathbf{j} - \mathbf{k}$. Find the angle between a and b, to 1 decimal place.	