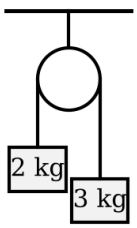
Day 10	A Level Maths: C Tier 10-a-day
1 Differentiate with respect to x: (a) 2 ln x (b) e^{2x} + sin 2x	
2 A sequence is defined by $u_{n+2} = u_{n+1} + u_n$, with $u_1 = 3$ and $u_2 = 4$. Find u_6.	
3 £5000 invested at 8% compound interest per year. After how many whole years will it first exceed £7500?	
4 Two particles of masses 2 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. 	
5 For 7 data pairs, with days of growth from 6 to 18, the regression line is H = 19 + 4d. Estimate plant height (cm) when d = 24 and comment on the reliability.	

Day 10	A Level Maths: C Tier 10-a-day
6 Two forces ($\mathbf{i} + 7\mathbf{j}$) N and ($-7\mathbf{i} + 2\mathbf{j}$) N act on a particle of mass 3 kg. No other horizontal forces act. Find the acceleration of the particle as a vector in terms of $\mathbf{i}$ and $\mathbf{j}$.	
7 X ~ B(20, p). H_0: p = 0.5, H_1: p > 0.5. Find the critical region for a test at the 10% significance level.	
8 A is (5, −1) and B is (7, 7). Find the equation of the perpendicular bisector of AB, in the form ax + by = c with integer a, b and c.	
9 A sector of a circle has radius 9 cm and angle 1.8 radians. Find (a) the arc length, (b) the perimeter of the sector.	
10 A circle has equation $(x - 4)^2 + (y + 4)^2 = 25$. Determine whether the point P(−8, 6) is inside, outside or on the circle.	