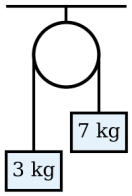
Day 115	A Level Maths: B Tier 10-a-day
1 (a) Write $2x^2 - 12x + 13$ in the form $a(x + p)^2 + q$. (b) Write down the coordinates of the minimum point of $y = 2x^2 - 12x + 13$.	
2 The curve C has equation $y = 3x^2 + e^{4x} - 3$. Find the equation of the tangent to C at the point where $x = 0$, in the form $y = mx + c$.	
3 A cyclist moves in a straight line. At time t seconds its acceleration is $t - 4$ m s^{-2}. When $t = 0$ the velocity is 7 m s^{-1}. Find the velocity when $t = 5$.	
4 Find (a) $\int \frac{3}{5x + 3}\,dx$, (b) the exact value of $\int_0^1 \frac{3}{5x + 3}\,dx$.	
5 Particles of mass 3 kg and 7 kg hang on a light string over a smooth fixed pulley, as shown, and are released from rest. Take g = 9.8 m s^{-2}. Find the acceleration and the tension in the string. 	

Day 115	A Level Maths: B Tier 10-a-day
6 Line l_1 has equation $7x + 10y = 49$ and line l_2 has equation $7x + 2y = -7$. The lines meet at P. Find the area of the triangle formed by l_1, l_2 and the x-axis.	
7 A cup of tea cools in a room at 15°C: $\frac{dT}{dt} = -k(T - 15)$. Initially $T = 95$ and after 5 minutes $T = 60$. Find k to 3 s.f. and the time to cool to 25°C, to 3 s.f.	
8 The line $3x + 4y = k$ is a tangent to the circle $(x - 2)^2 + (y + 2)^2 = 100$. Find the two possible values of k.	
9 $X \sim B(25, p)$. H_0: $p = 0.3$ is to be tested against H_1: $p > 0.3$ at the 10% significance level. Find the critical region and the actual significance level.	
10 $X \sim B(100, 0.5)$. Use a normal approximation to find $P(50 \leq X \leq 55)$, to 3 significant figures.	