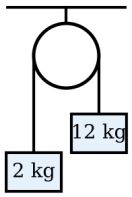
Day 148	A Level Maths: B Tier 10-a-day
1 A box of mass 20 kg rests on a rough horizontal floor, with coefficient of friction 0.4. A horizontal force of 63 N is applied to the box. Take g = 9.8 m s^{-2}. Determine whether the box moves. Find the friction force, or the acceleration if it moves.	
2 Values of y = f(x) are shown. x: 2, 2.5, 3, 3.5, 4 y: 1.9, 0.8, 0.9, 1.7, 2.2 Estimate $\int_2^4 f(x)\,dx$ using the trapezium rule.	
3 Find the binomial expansion of $(2 - 2x)^7$ in ascending powers of x, up to and including the term in x^3.	
4 Particles of mass 2 kg and 12 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. 	
5 A player says she scores with probability 0.25. In 30 shots she scores 6 times. Test, at the 5% level, whether the true proportion is lower than claimed.	

Day 148	A Level Maths: B Tier 10-a-day
6 Line l_1 has equation $5x + 4y = -25$ and line l_2 has equation $5x - 8y = 35$. The lines meet at P. Find the area of the triangle formed by l_1, l_2 and the x-axis.	
7 (a) Write $\frac{-3}{(x+3)(x+4)}$ in partial fractions. (b) Hence evaluate $\int_0^4 \frac{-3}{(x+3)(x+4)}\,dx$, giving the answer as a single logarithm.	
8 Bottle volumes are normal, s.d. 6 ml. Set mean 50 ml; 40 bottles have mean 51.3 ml. Test at the 5% level whether the true mean is greater than 50.	
9 The line $y = 2x + 18$ meets the circle $(x + 3)^2 + (y + 3)^2 = 50$ at the points A and B. Find the coordinates of A and B, and the exact length of the chord AB.	
10 Find the coordinates of the stationary point of the curve $y = xe^{-x}$, and determine its nature.	