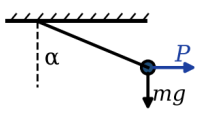
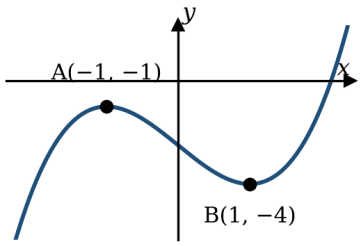
Day 36	A Level Maths: B Tier 10-a-day
1 A puck of mass 2 kg is moving on a smooth horizontal surface at 8 m s^{-1} when a constant horizontal force of 20 N, in the direction of motion, acts for 6 s. Find the speed of the puck at the end of this time and the distance it moves.	
2 The first term of an arithmetic series is 3 and the common difference is 4. The sum of the first n terms is 171. Find the value of n.	
3 Solve $5^x > 99$, giving your answer to 3 s.f.	
4 The random variable X has E(X) = 3 and Var(X) = 3. Find (a) E(−2X − 1), (b) Var(−2X − 1), (c) $E(X^2)$.	
5 A particle of mass 1 kg hangs in equilibrium on a light string inclined at α to the vertical, held by a horizontal force P N, as shown. $\tan\alpha = \frac{12}{5}$. Take g = 9.8 m s^{-2}. Find the tension in the string and the value of P. 	

Day 36 **A Level Maths: B Tier 10-a-day**

6 The diagram shows the curve y = f(x). A and B are the turning points. Find the turning points of:
(a) y = f(x − 5) (b) y = −f(x)



7 Data are modelled by $y = ab^x$, where a and b are constants.
A plot of $\log_{10} y$ against x is a straight line with intercept 0.699 and gradient 0.602.
Find a and b to 2 significant figures.

8 The curve C has equation $y = x^3 - 3x^2 - 2x - 4$.
C is reflected in the x-axis.
Find its new equation.

9 Solve $\frac{dy}{dx} = 5xy$, given that y = 4 when x = 0.
Give y in terms of x.

10 The region R is bounded by the curve $y = x^2 + 2$, the x-axis
and the lines x = 0 and x = 2.
R is rotated through 360° about the x-axis. Find the exact volume generated.

