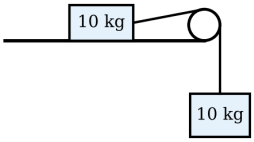
Day 270	A Level Maths: B Tier 10-a-day
1 Solve $4\tan^2 x - 4\tan x - 3 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.	
2 A particle moves on a straight line. Its displacement from O at time t seconds is $s = 4t^3 - 4t^2 + 8t$ metres. Find its velocity and acceleration when $t = 4$.	
3 Find (a) $\int (5x + 5)^5 \, dx$, (b) the exact value of $\int_0^2 (5x + 5)^5 \, dx$.	
4 For 12 pairs of values, $\bar{x} = 12$, $\bar{y} = 25$, $S_{xx} = 20$ and $S_{xy} = -20$. (a) Find the regression line of y on x in the form $y = a + bx$. (b) Estimate y when $x = 10$.	
5 Prove that the sum of 7 consecutive odd integers is always a multiple of 7.	

Day 270 **A Level Maths: B Tier 10-a-day**

6 A particle of mass 10 kg lies on a smooth horizontal table. It is attached by a light string over a smooth pulley at the edge of the table to a particle of mass 10 kg hanging freely.
Take $g = 9.8\ m\ s^{-2}$.
The system is released from rest. Find the acceleration and the tension in the string.



7 Solve $x(x + 3)(x + 4) \leq 0$.

8 $\mathbf{a} = \begin{pmatrix} -2 \\ 0 \\ -4 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -2 \\ 1 \\ -4 \end{pmatrix}$.
Find the angle between a and b, to 1 d.p.

9 40 members: 20 swim, 11 cycle, 18 do neither.
(a) How many do both?
(b) Given a person who swims, find P(this person cycles).

10 A curve has parametric equations $x = 3t + 3$, $y = t^2 + 6t + 1$.
The line $y = 3x - 4$ meets the curve at two points.
Find the coordinates of these points.