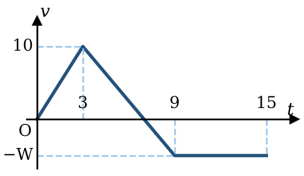
Day 79	A Level Maths: S Tier 10-a-day

1 Solve the simultaneous equations
$\log_5 x + \log_5 y = 5$
$x - y = 100$

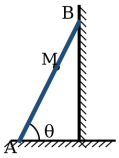
2 Large Data Set, daily mean air temperature (°C), Heathrow, July 2015 (n = 184): mean 11.6, sd 3.8. (F = 1.8C + 32)
(a) Find the mean and sd in °F.
(b) Is a reading of 17.3 more than 2 sd above the mean?

3 $f(x) = \dfrac{12}{x^2 - 4x + 6}$ for all real x.
Find the greatest value of f(x), the value of x at which it occurs, and the range of f.

4 The diagram shows the velocity-time graph of a particle P moving on a straight line (velocity in m s^{-1}, time in s). At time 15 s, P is back at its starting point.
Find (a) the value of W, (b) the greatest distance of P from its starting point.



5 A curve is given by $x = y^3 + 2y^2 + 2y$.
Find dy/dx and d^2y/dx^2 when $y = -1$.

Day 79	A Level Maths: S Tier 10-a-day
6 An arithmetic sequence has $u_5 = 31$ and $S_8 = 220$. (a) Find the first term and common difference. (b) Find the least n for which $S_n > 264$.	
7 For 20 pairs of values, $S_{xx} = 784$, $S_{yy} = 841$ and $S_{xy} = 256$. (a) Calculate the product moment correlation coefficient r. (b) The critical value for a two-tailed test at the 1% level with n = 20 is 0.5614. Carry out the test of H_0: $\rho = 0$ against H_1: $\rho \neq 0$.	
8 A uniform ladder AB of length 5 m and weight 300 N has A on rough ground ($\mu = 0.35$) and B against a smooth vertical wall. It makes angle θ with the ground, $\tan\theta = 2$. A man of weight 400 N climbs the ladder. How far along the ladder can he go before it slips? 	
9 $\frac{dy}{dx} = \frac{9x^2}{y}$, $y > 0$, and $y = 4$ when $x = 0$. Find y in terms of x, and the value of y when x = 4.	
10 Solve $\|2x + 4\| > \|3x - 4\|$.	