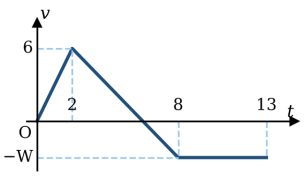
Day 71	A Level Maths: S Tier 10-a-day
1 A stone is thrown vertically upwards with speed 15 m s^{-1} from the top of a cliff. The top of the cliff is 18.4 m above the sea. Find (a) the time taken for the stone to reach the sea, (b) the total distance travelled by the stone, to 3 s.f. Take g = 9.8 m s^{-2}.	
2 f(x) = 2x + 4 and g(x) = $x^2 - 2$. Solve fg(x) = gf(x).	
3 Solve 2 ln x = ln(x + 4) + ln 2, stating clearly why one root is rejected.	
4 A curve has parametric equations x = 2 + 3cos t, y = 1 + 3sin t. Find its Cartesian equation.	
5 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 13 s, P is back at its starting point. Find (a) the value of W, (b) the greatest distance of P from its starting point. 	

Day 71	A Level Maths: S Tier 10-a-day
6 A curve has parametric equations $x = 3t^2 - t$, $y = 2t^3 + 4t$. Find the equation of the tangent at the point where $t = 1$, in the form $y = mx + c$.	
7 The size of a rod is $N(110, 4^2)$ mm. A rod is 'large' if it exceeds 114. (a) Find the probability that a rod is large. (b) 13 rods are chosen at random. Find the probability that at least 3 are large.	
8 The tangent to $y = x\sqrt{2x + 8}$ at the point where $x = 4$ meets the axes at A and B. Find the exact area of triangle OAB, where O is the origin.	
9 For $n = 12$ pairs of values: $\Sigma x = 180$, $\Sigma y = 540$, $\Sigma x^2 = 2884$, $\Sigma xy = 8560$. (a) Find the equation of the regression line of y on x. (b) The x values lie between 11 and 20. Estimate y when $x = 19$ and comment on its reliability.	
10 Describe a sequence of two transformations that maps the curve $y = x^2$ onto the curve $y = 5x^2 + 30x + 48$.	