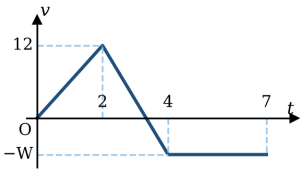
Day 72	A Level Maths: S Tier 10-a-day
1 Express $\frac{2x^3 - 6x^2 - 12x + 37}{(x-2)(x-3)}$ in the form $ax + b + \frac{C}{(x-2)} + \frac{D}{(x-3)}$.	
2 A ball is thrown vertically upwards from ground level with speed 39.2 m s^{-1}. Find the length of time for which the ball is more than 73.5 m above the ground, and the greatest height it reaches. Take g = 9.8 m s^{-2}.	
3 A data set has lower quartile 29 and upper quartile 46. An outlier is a value more than 1.5 × IQR beyond the nearest quartile. (a) Find the range of values that are not outliers. (b) 10 observations have mean 36. The largest is 78, an outlier, and it is removed. Find the new mean.	
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 7 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 school has 200 students in Year 10, 100 in Year 11 and 60 in the sixth form. A stratified sample of 36 students is taken. (a) Find the number sampled from each group. (b) Two students are chosen at random from the sample. Find the probability they are from the same group.	

Day 72	A Level Maths: S Tier 10-a-day
6 $u_{n+1} = \frac{1}{2}u_n + 5$, $u_1 = -1$. (a) Find the limit L of the sequence. (b) Find the least n such that $\lvert u_n - L \rvert < 0.001$.	
7 The points A, B, C have coordinates $(-2, -2, 1)$, $(2, 3, -1)$, $(2, -3, -2)$. Find angle ABC to 1 d.p., and the exact area of triangle ABC.	
8 Use the substitution $u = x^2 + 4$ to find the exact value of $\int_0^2 x(x^2 + 4)^4 \, dx$	
9 A geometric series has first term 6 and common ratio 5. Find the least n for which $S_n > 7666$.	
10 A and B are acute angles with $\tan A = \frac{1}{5}$ and $\tan B = \frac{2}{3}$. Find $\tan(A + B)$ and hence show that $A + B = \frac{\pi}{4}$.	