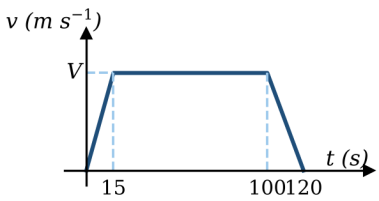
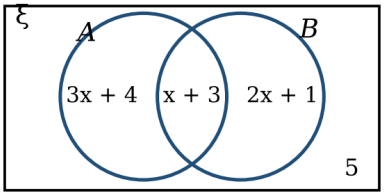
Day 158	A Level Maths: A Tier 10-a-day
1 A data set has mean 70 and standard deviation 3. A value is treated as an outlier if it is more than 3 standard deviations from the mean. Which of 58, 75, 83, 85 are outliers?	
2 A ball is thrown vertically upwards at 24.5 m s^{-1} from a point h m above horizontal ground, and hits the ground 6 s later. Find (a) h, (b) the greatest height above the ground. Take g = 9.8.	
3 $y = \ln(x^2 + 4)$. Find $\frac{dy}{dx}$ and the gradient of the curve at $x = -1$.	
4 The sum of the first n terms of an arithmetic series is $S_n = n^2 - 3n$. (a) Find the first term and the common difference. (b) Find u_{24}.	
5 The diagram shows the speed-time graph for a train journey of 2050 m. Find (a) V, (b) the deceleration in the final stage. 	

Day 158	A Level Maths: A Tier 10-a-day
6 Solve $3\sec^2 x - 6\tan x - 12 = 0$ for $0° \leq x \leq 180°$. Give answers to 1 d.p.	
7 The Venn diagram shows the numbers of 49 students in sets A and B. (a) Find the value of x. (b) A student is chosen at random. Find P(A′ | B′). 	
8 Prove by contradiction that $\sqrt{5}$ is irrational.	
9 An open-topped box has a square base of side x cm and volume 4 cm^3. Show that its surface area is $A = x^2 + \frac{16}{x}$, and find the least possible value of A, justifying that it is a minimum.	
10 Expand $(4 - 3x)^{-2}$ in ascending powers of x, up to and including x^2. State the range of x for which the expansion is valid.	