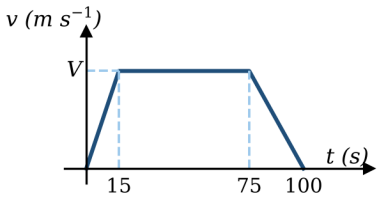
Day 5	A Level Maths: A Tier 10-a-day
1 At one location, the daily maximum gust is modelled by N(20.6, 6^2). (a) Find the probability that on a randomly chosen day the value exceeds 30 knots. (b) Estimate the number of such days in a period of 62 days.	
2 A crate of mass 12 kg is pushed at constant speed along rough horizontal ground, $\mu = \frac{1}{3}$, by a force of P N at angle θ below the horizontal, $\tan\theta = \frac{12}{5}$. Find P and the normal reaction. Take g = 9.8.	
3 Solve $2\cos^2\theta + 3\sin\theta - 3 = 0$ for $0° \leq \theta \leq 180°$.	
4 The diagram shows the speed-time graph for a train journey of 2000 m. Find (a) V, (b) the deceleration in the final stage. 	
5 $f(x) = x^2 - 4x + 2$, $x \geq 2$. Find $f^{-1}(x)$ and state its domain.	

Day 5	A Level Maths: A Tier 10-a-day
6 Solve $4\sec^2 x - 14\tan x - 12 = 0$ for $0° \leq x \leq 360°$. Give answers to 1 d.p.	
7 A salary is £40000 in year 1 and increases by 4% each year. In which year does the salary first exceed £80000?	
8 The random variable X has pdf $f(x) = \frac{3}{64}x^2$ for $0 \leq x \leq 4$, and 0 otherwise. (a) Find the cumulative distribution function F(x) for $0 \leq x \leq 4$. (b) Find $P(X > 2)$. (c) Find the median of X to 3 s.f.	
9 The line $3x - 4y = 0$ meets the circle $(x + 4)^2 + (y - 2)^2 = 25$ at the points A and B. Find the exact length of AB.	
10 $y = \text{cosec}(3x)$. Find $\frac{dy}{dx}$ and its exact value at $x = \frac{\pi}{12}$.	