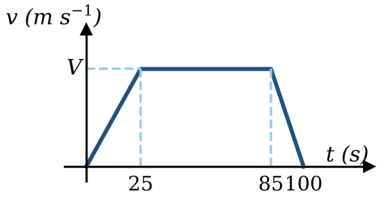
Day 82	A Level Maths: A Tier 10-a-day

1 Express $\frac{5}{(x-2)} - \frac{3}{(x-5)}$ as a single fraction in its simplest form.

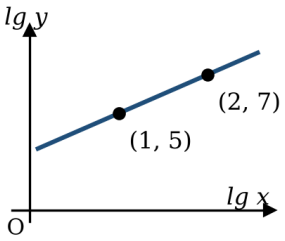
2 Solve $2^{2x-3} = 5^{2x-2}$.
Give your answer to 3 significant figures.

3 The diagram shows the speed-time graph for a train journey of 720 m. Find (a) V, (b) the deceleration in the final stage.



4 For a sample of 6 pairs of values of daily rainfall and ice cream sales, r = 0.87.
The critical value for a one-tailed test at the 5% level is 0.7293.
Test, at this level, whether there is positive correlation between the two variables.

5 $f(x) = x^3 + ax^2 + bx + 36$, where a and b are constants.
$(x - 3)$ is a factor of f(x). The remainder when f(x) is divided by $(x - 1)$ is 24.
(a) Find a and b. (b) Solve f(x) = 0.

Day 82	A Level Maths: A Tier 10-a-day
6 Customers enter a shop at random at an average of 2 per hour. Find the probability that in a 30-minute period there are (a) zero events (b) at least 3. (c) Find the probability that at least one occurs in each of two separate 30-minute periods.	
7 A 8 kg block is released from rest on a rough plane inclined at α, $\tan\alpha = \frac{3}{4}$, $\mu = 0.25$, and slides 2 m down a line of greatest slope. Use work and energy to find (a) the work done against friction, (b) its speed after 2 m. Take $g = 10$.	
8 The diagram shows the graph of lg y against lg x for $y = A x^n$. Find the value of n and the value of A. 	
9 Prove by contradiction that $\sqrt{11}$ is irrational.	
10 A curve has equation $4x^2 + xy + y^2 = 60$. Find the coordinates of the points where the tangent is parallel to the x-axis.	