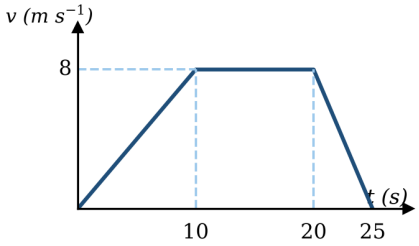
Day 313 **A Level Maths: B Tier 10-a-day**

1 Line l_1 has equation $7x - 3y = -21$ and line l_2 has equation $7x + 2y = 14$.
The lines meet at P. Find the area of the triangle formed by l_1, l_2 and the x-axis.

2 Items numbered 1 to 96; systematic sample of size 8.
(a) Find the sampling interval.
(b) The first item is number 1. Find the 6-th item.

3 The diagram shows the speed-time graph of a train between two stations.
Find (a) the acceleration in the first 10 s, (b) the distance between the stations.



4 Solve $\frac{dy}{dx} = \frac{4y}{x}$ for $x > 0$,
given that $y = 4$ when $x = 1$.

5 Solve $(x + 2)(x - 3)(x + 5) \geq 0$.

Day 313	A Level Maths: B Tier 10-a-day

6 Given that each component fails independently with probability 0.2, find the least number of components needed for the probability of at least one success to exceed 0.95.

7 A particle moves so that at time t s its velocity is $\mathbf{v} = (3t^2 + 5)\mathbf{i} + (2t - 6)\mathbf{j}$ m s^{-1}.
Find the time when the particle is moving in the direction of $\mathbf{i}$, and its speed then.

8 A curve has parametric equations $x = 2t + 1$, $y = t^2 - t - 1$, $t \in \mathbb{R}$.
Find a Cartesian equation of the curve in the form $y = f(x)$.

9 Line l_1: $\mathbf{r} = \begin{pmatrix} 1 \\ 1 \\ 2 \end{pmatrix} + \lambda \begin{pmatrix} 2 \\ 1 \\ 0 \end{pmatrix}$.
Line l_2: $\mathbf{r} = \begin{pmatrix} 3 \\ 0 \\ 1 \end{pmatrix} + \mu \begin{pmatrix} 0 \\ -2 \\ -1 \end{pmatrix}$.
Show that l_1 and l_2 intersect and find the point.

10 The diagram shows the curve $y = x(6 - x)$ and the line $y = 2x$.
Find the exact area of the shaded region R.

