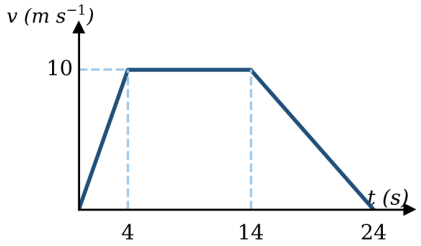
Day 50	A Level Maths: B Tier 10-a-day

1 Solve $\tan 2x = 2$ for $0 \leq x \leq \pi$,
giving answers to 3 significant figures.

2 $P(X = x) = kx$ for $x = 1, 2, ..., 4$.
(a) Find k.
(b) Find $E(X)$ and $\text{Var}(X)$.

3 The diagram shows the speed-time graph of a train between two stations.
Find (a) the acceleration in the first 4 s, (b) the distance between the stations.



4 A circle has centre $(-4, -2)$ and passes through the point $(-4, 2)$.
Find an equation of the circle.

5 A sledge of mass 4 kg is pulled across smooth horizontal ice by a rope with tension 25 N, inclined at α above the horizontal, where $\tan \alpha = \frac{4}{3}$.

Take $g = 9.8$ m s^{-2}.
Find (a) the acceleration of the sledge, (b) the normal reaction of the ice.

Day 50	A Level Maths: B Tier 10-a-day
6 (a) Write $\frac{-2x-3}{(x+2)(x+3)}$ in partial fractions. (b) Hence evaluate $\int_0^2 \frac{-2x-3}{(x+2)(x+3)}\,dx$, giving the answer as a single logarithm.	
7 X has a binomial distribution with mean 4 and variance 3.2. (a) Find n and p. (b) Find P(X = 4) to 3 significant figures.	
8 Solve $\tan^2 x + 5\sec x + 7 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p.	
9 Solve $x^2 - 2x - 3 > 0$.	
10 Prove, by exhaustion, that a cube number cannot be written in the form $7k + 3$, where k is an integer.	