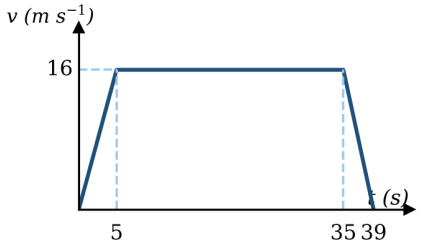
Day 212 **A Level Maths: B Tier 10-a-day**

1 A summary of the ages, a years, of 11 members of a club gives $\Sigma a = 323$ and $\Sigma a^2 = 11693$.
Find the mean and the standard deviation (3 s.f.).

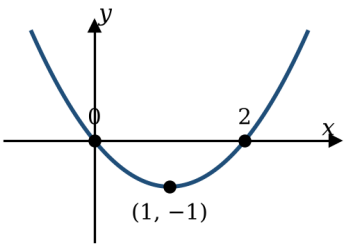
2 The diagram shows the speed-time graph of a train between two stations.
Find (a) the acceleration in the first 5 s, (b) the distance between the stations.



3 A curve has equation $y = \frac{-3}{x+2} - 1$.
(a) Write down the asymptotes.
(b) Find where the curve crosses the axes.

4 Differentiate $y = 3\tan x$ with respect to x,
and find the exact gradient when $x = \frac{\pi}{4}$.

5 The diagram shows the curve y = f(x), a quadratic.
(a) Find the coordinates of the local maximum point of y = |f(x)|.
(b) How many solutions has |f(x)| = 1?



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6 A bead of mass 0.5 kg is released from rest 22.5 m above the ground and falls freely. Take g = 9.8 m s^{-2}. Use energy to find its speed on reaching the ground.	
7 Given that $\tan\theta = -\frac{7}{24}$ and $90° < \theta < 180°$, find the exact value of $\sin 2\theta$.	
8 Express $\frac{x + 28}{(x - 2)(x + 3)}$ in partial fractions.	
9 The mass X g of a flour bag is normal with mean 50, s.d. 4. Find k (3 s.f.): (a) P(X < k) = 0.2, (b) P(X > k) = 0.01.	
10 Find the exact value of cot 60°, giving your answer with a rational denominator.	