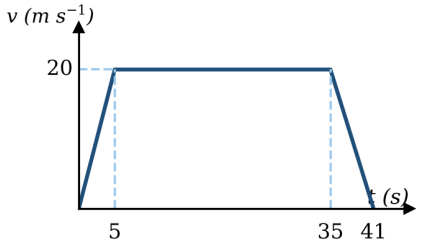
Day 318 **A Level Maths: B Tier 10-a-day**

1 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.

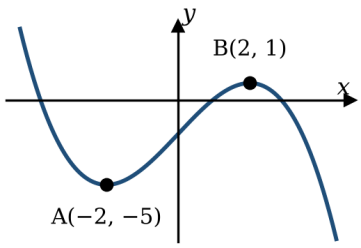


2 A sector of a circle has radius 3 cm and angle 45°.
Find, in terms of π, the arc length and the area of the sector.

3 Simplify $\frac{(4x)^3 \times 4x^2}{8x^2}$.

4 A particle is in equilibrium under three forces: P N at angle θ above the positive x-axis, a force of 48 N in the negative x-direction and a force of Q N in the negative y-direction.
$\cos\theta = \frac{12}{13}$. Find P and Q.

5 The diagram shows the curve y = f(x). A and B are the turning points. Find the turning points of:
(a) y = f(−x) (b) y = f(x) − 1



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6 (a) Write $\frac{6}{(x+2)(x+5)}$ in partial fractions. (b) Hence evaluate $\int_0^1 \frac{6}{(x+2)(x+5)}\,dx$, giving the answer as a single logarithm.	
7 A battery lasts X hours, normal with mean 250. Given P(X > 215.1) = 0.99, find the standard deviation (3 s.f.).	
8 Given that $24\cos\theta + 7\sin\theta \equiv 25\cos(\theta - 16.3°)$, solve $24\cos\theta + 7\sin\theta = -3$ for $0 \leq \theta \leq 360°$. (1 d.p.)	
9 A factory says a proportion 0.25 of its parts are defective. In a sample of 50 parts, 6 are defective. Test, at the 5% significance level, whether the proportion is different from 0.25.	
10 Given that $\sum_{r=1}^{n}(3r - 2) = 176$, find the value of n.	