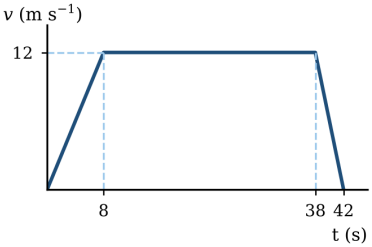
Day 266 **A Level Maths: C Tier 10-a-day**

1 A curve has parametric equations
$x = 2t + 2$, $y = t^2 + 4$.
The point P has y-coordinate 13 and positive t.
Find the coordinates of P.

2 The graph shows the velocity of a train over 42 seconds as it moves in a straight line.
(a) Find its acceleration in the first 8 s.
(b) Find the total distance travelled.



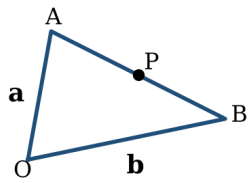
3 $x = 3\cos t$, $y = 2\sin t$.
Find $\frac{dy}{dx}$ in terms of t, and its value when $t = \frac{\pi}{4}$.

4 A particle moves in a straight line with velocity $v = (3t^2 - 2t + 4)$ m s^{-1} at time t seconds.
Find the distance travelled between t = 1 and t = 4 (the particle does not turn round).

5 Solve $|4x - 1| = 9$.

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6 In the diagram, OA = **a**, OB = **b**, and P lies on AB with AP : PB = 1 : 1.
Find AB and AP in terms of **a** and **b**.



7 How many different arrangements are there of the letters of the word LETTER?

8 The line $y = 4x + k$ is a tangent to the curve $y = x^2 + 5$.
Find the value of k.

9 A(3, 2), B(15, 10) and C(30, k).
Given that A, B and C are collinear, find k.

10 A population is $N(\mu, 6^2)$. H_0: $\mu = 55$, H_1: $\mu \neq 55$.
A sample of 36 has mean $\bar{x} = 56.2$.
Test at the 5% level. Critical value: $z = \pm 1.96$.