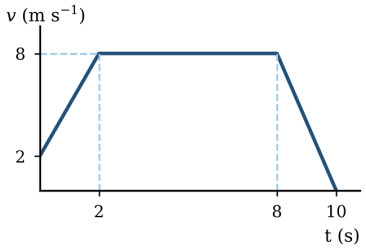
Day 315 **A Level Maths: C Tier 10-a-day**

1 A curve has parametric equations
$x = 4t - 1$, $y = 3t^2 - 3$.
Find the coordinates of the point where $t = -2$.

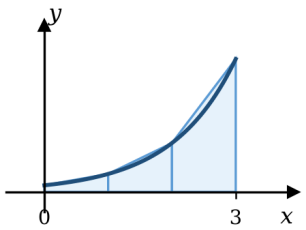
2 Differentiate with respect to x:
(a) $2 \cos 4x$
(b) $2e^{4x}$

3 Write $3x^2 - 12x + 14$ in the form $a(x + p)^2 + q$.

4 The graph shows the velocity of a skater.
(a) Find the acceleration in the first 2 s.
(b) Find the deceleration in the last 2 s.
(c) Find the total distance travelled.



5 The diagram shows the curve $y = e^x$ from $x = 0$ to $x = 3$ divided into 3 strips of equal width.
Use the trapezium rule with these strips to estimate the shaded area to 3 s.f.



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6 X ~ B(19, 0.4). Find P(8 ≤ X ≤ 11), giving your answer to 3 s.f.	
7 Evaluate $\sum_{k=1}^{4} 3 \times 3^{k-1}$.	
8 A curve has equation $x^2 + xy = 8$. Find dy/dx in terms of x and y, and hence the gradient at (2, 2).	
9 A ball is dropped from rest from the top of a cliff of height 78.4 m. Take g = 9.8 m s^{-2} and ignore air resistance. Find (a) the time taken to reach the ground, (b) its speed on hitting the ground.	
10 The mean of 15 ages of the men is 63. The mean of 10 ages of the women is 48. Find the mean of all 25 values.	