Day 360	A Level Maths: C Tier 10-a-day
1 A particle has initial velocity $(\mathbf{i})$ m s^{-1} and constant acceleration $(2\mathbf{i} - \mathbf{j})$ m s^{-2}. Find its velocity after 2 s.	
2 $f(x) = \sqrt{x + 6} - 4$. State the largest possible domain and the range of f.	
3 The table shows values of y = f(x). x: 1 1.5 2 2.5 3 y: 5.9 3.6 8.2 4.2 4.7 Use the trapezium rule to estimate the area under the curve between x = 1 and x = 3.	
4 Find the first four terms, in ascending powers of x, of the expansion of $(1 + 3x)^6$.	
5 Differentiate with respect to x: (a) 2 sin 2x (b) e^{2x} + sin 2x	

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6 A population is N(μ, 8^2). H_0: $\mu = 35$, H_1: $\mu > 35$.
A sample of 64 has mean $\bar{x} = 37.5$.
Test at the 5% level. Critical value: $z = 1.645$.

7 A rectangle has perimeter 60 cm.
Find the maximum possible area of the rectangle and the dimensions that give it.

8 Divide $f(x) = x^3 + 9x^2 + 14x - 20$ by $(x + 4)$.
Find the quotient and the remainder.

9 A train's engine works at a constant rate of 16 kW. Find the driving force when the vehicle is moving at 20 m s^{-1}.

10 The histogram shows the times, t minutes, taken by some people to complete a puzzle.
Find the number of people who took between 20 and 40 minutes.

