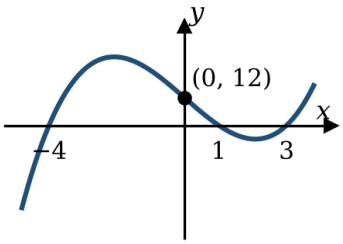
Day 196	A Level Maths: C Tier 10-a-day
1 Differentiate with respect to x: (a) $5\,e^{3x}$ (b) $5 \ln x$	
2 A body moves in a straight line. Its displacement from O at time t seconds is s metres, where $s = t^3 - t^2 + 2t + 2$. Find its velocity when $t = 2$.	
3 Solve $5^x = 50$. Give your answer to 3 significant figures.	
4 Use proof by exhaustion to show that $n^3 + 5n$ is divisible by 6 for every integer n with $1 \leq n \leq 5$.	
5 A car of mass 1200 kg tows a caravan of mass 400 kg on a level road with acceleration 0.5 m s^{-2}. Resistances: 400 N on the car, 100 N on the caravan. Find the driving force and the tow bar tension.	

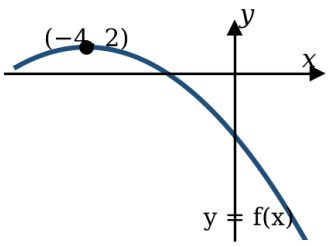
Day 196 **A Level Maths: C Tier 10-a-day**

6 The diagram shows the curve y = f(x), where f(x) is a cubic. Find f(x) in the form k(x − a)(x − b)(x − c).



7 A population is N(μ, 10^2). H_0: μ = 115, H_1: μ ≠ 115.
A sample of 16 has mean $\bar{x}$ = 123.25.
Test at the 5% level. Critical value: z = ±1.96.

8 The diagram shows the curve y = f(x). The maximum point is shown. Write down the coordinates of the maximum point on the curve with equation
(a) y = f(x − 3) (b) y = f(x + 3)



9 A player takes free throws until she scores, with probability 0.5 each time. X is the number of throws.
Find P(X = 2), to 3 s.f.

10 A(−2, 3), B(4, −1) and C(13, k).
Given that A, B and C are collinear, find k.