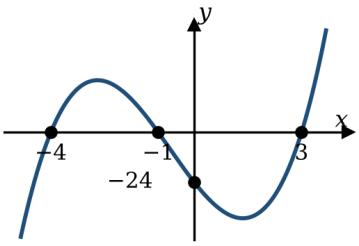
Day 108	A Level Maths: B Tier 10-a-day
1 Solve $\tan^2 x - 2\tan x - 3 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.	
2 Simplify $\frac{(5x^2)^3 \times 6x^4}{2x^2}$.	
3 Find (a) $\int 3\sec^2 5x \, dx$, (b) the exact value of $\int_0^{\frac{\pi}{20}} 3\sec^2 5x \, dx$.	
4 A ball is projected from level ground with horizontal velocity component 11 m s^{-1} and vertical velocity component 24.5 m s^{-1} upwards. Take g = 9.8 m s^{-2}. Find (a) the time of flight, (b) the horizontal range.	
5 For 14 pairs of values, $\bar{x} = 6$, $\bar{y} = 25$, $S_{xx} = 50$ and $S_{xy} = -50$. (a) Find the regression line of y on x in the form y = a + bx. (b) Estimate y when x = 4.	

Day 108 **A Level Maths: B Tier 10-a-day**

6 The diagram shows a sketch of the curve y = f(x), where f is a cubic. The curve meets the axes at the labelled points. Find f(x) in factorised form.



7 Data are modelled by $y = ax^n$. A plot of $\log_{10} y$ against $\log_{10} x$ is a straight line with intercept 0.477 and gradient 0.5.
Find a (2 s.f.) and n, then estimate y when x = 4 (3 s.f.).

8 Solve $2\sin^2 x + \cos x - 1 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.

9 Particles A (3 kg) and B (12 kg) are joined by a light string over a smooth pulley. Both are held with the string taut, B is 6 m above the ground, then released.
Take g = 9.8 m s^{-2}.
Find the speed with which B hits the ground.

10 Prove by contradiction that there are no integers
m and n such that 28m + 21n = 58.