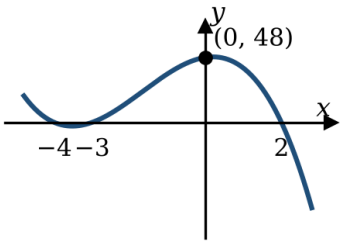
Day 160	A Level Maths: C Tier 10-a-day
1 Use integration by parts to find $\int x \sin 2x \, dx$.	
2 A particle moves with constant velocity $(-3\mathbf{i} + 4\mathbf{j})$ m s^{-1}. At time t = 0 its position vector is $(2\mathbf{i} + 5\mathbf{j})$ m. (a) Find its position vector when t = 5. (b) Find the distance it travels in 5 s.	
3 Expand and simplify $(6 - \sqrt{5})^2$.	
4 X ~ B(18, 0.4). Find P(X ≤ 9), giving your answer to 3 s.f.	
5 Use the product rule to differentiate $y = e^{3x} \sin 4x$.	

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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 X ~ B(15, p). H_0: p = 0.5, H_1: p < 0.5.
Find the critical region for a test at the 1% significance level.

8 Find the set of values of x satisfying both $2x - 2 > 6$ and $x^2 - 5x < 0$.

9 Car A passes a point O at constant speed 8 m s^{-1}.
At that instant car B starts from rest at O with constant acceleration 4 m s^{-2} in the same direction. Find the time when B catches up A.

10 Use the substitution $u = x^2 + 2$ to find $\int 2x(x^2 + 2)^3 \, dx$.