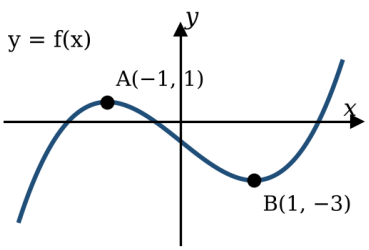
Day 200	A Level Maths: A Tier 10-a-day
1 Find the exact value of $\int_1^4 (4\sqrt{x} + \frac{2}{\sqrt{x}})\,dx$.	
2 Solve $5^{3x+2} = 25^{2x-3}$.	
3 X ~ B(200, 0.2). Use a normal approximation to estimate P(X ≥ 43) to 3 significant figures.	
4 A curve has equation $2x^2 + 3xy + 2y^2 - y = 6$. Show that P(−3, 2) lies on the curve and find the equation of the tangent at P in the form ax + by + c = 0 with integer a, b, c.	
5 The diagram shows the curve y = f(x), with turning points A and B. Find the coordinates of the turning points of (a) y = f(x) + 3 (b) y = 2f(x)  	

Day 200	A Level Maths: A Tier 10-a-day
6 Solve $\cos 2\theta + 3\sin\theta = -1$ for $0 \leq \theta \leq 2\pi$.	
7 20 values have $\Sigma x = 760$ and $\Sigma x^2 = 29200$. One value was recorded as 44 but should have been 38. Find the correct mean and standard deviation (3 s.f.).	
8 Particle A (2 kg) lies on a rough table, $\mu = 0.25$, joined by a light string over a smooth pulley to particle B (3 kg), 1.2 m above the floor. Released from rest; B lands without rebounding. Find (a) the acceleration of A before B lands, (b) the further distance A moves. Take $g = 9.8$.	
9 A circle passes through A(2, −7) and B(−10, 9). Its centre lies on the line $y = x + 5$. Find the equation of the circle.	
10 At t = 0, P and Q have position vectors $(20\mathbf{i} - 7\mathbf{j})$ m and $(3\mathbf{i} - \mathbf{j})$ m and velocities $(-7\mathbf{i} - 5\mathbf{j})$ m s^{-1} and $(-3\mathbf{i} - 2\mathbf{j})$ m s^{-1}. Find (a) the time when they are closest, (b) the least distance between them.	