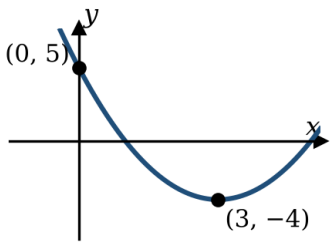
Day 90	A Level Maths: C Tier 10-a-day
1 A model relates the temperature, T °C, of a cooling drink to the time, t minutes, since pouring by $T = 73 - 2.3t$. Interpret the value 73 in this context.	
2 $\mathbf{a} = 4\mathbf{i} + 6\mathbf{j}$ and $\mathbf{b} = 8\mathbf{i} + k\mathbf{j}$, where k is a constant. Given that a and b are parallel, find the value of k.	
3 Two cyclists start at the same time from points P and Q, 96 m apart, and cycle directly towards each other at constant speeds of 7 m s^{-1} and 9 m s^{-1}. Find the time until they meet.	
4 Find the first four terms, in ascending powers of x, of the expansion of $(1 + 4x)^7$.	
5 A particle moves with constant velocity $(3\mathbf{i} + 4\mathbf{j})$ m s^{-1}. It is at the point with position vector $(2\mathbf{i} - \mathbf{j})$ m at t = 0. Find the time when its position vector is $(20\mathbf{i} + 23\mathbf{j})$ m.	

Day 90	A Level Maths: C Tier 10-a-day
6 Divide $f(x) = 2x^3 - 10x^2 + 4x + 8$ by $(x - 4)$. Find the quotient and the remainder.	
7 A population is $N(\mu, 8^2)$. H_0: $\mu = 100$, H_1: $\mu > 100$. A sample of 49 has mean $\bar{x} = 102.17$. Test at the 5% level. Critical value: $z = 1.645$.	
8 Variables x and y satisfy $y = ax^n$. A graph of $\log_{10} y$ against $\log_{10} x$ is a straight line with gradient 2 and intercept 1.3. Find n and a, giving a to 3 significant figures.	
9 The diagram shows a sketch of a quadratic curve. Find its equation in the form $y = a(x - p)^2 + q$. 	
10 Use a double angle formula to find $\int \sin 2x \cos 2x \, dx$.	