Day 226	IGCSE 10-a-day
1 The number of a population of insects doubles every 5 days. At the start there are 200. How many are there after 10 days?	
2 A tank is $\frac{3}{8}$ full. 72 more litres of water are added and the tank is then $\frac{3}{5}$ full. Work out the capacity of the tank.	
3 The curve $y = x^3 - 6x^2 + 9x - 8$ has two stationary points, A and B. Work out the vertical distance between A and B.	
4 A fair 4-sided dice and a fair 6-sided dice are each thrown once. The first score and the second score are recorded. (a) Work out the probability that the sum is greater than 6. (b) Given that at least one number is 3, work out the probability that the sum is greater than 6.	
5 Here are the first five terms of a quadratic sequence. 3, 17, 39, 69, 107 Find an expression for the nth term.	

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6 $y = -x^3 + 3x^2$ (a) Find the coordinates of the stationary points. (b) Use $\frac{d^2y}{dx^2}$ to decide whether each is a maximum or a minimum.	
7 x is an obtuse angle and $\sin x = \frac{1}{7}$. (a) Find the exact value of cos x. (b) Find the exact value of tan x. Give each answer as a fraction or a surd. Do not use a calculator.	
8 The first three terms of a geometric sequence are 24, 72, 216 (a) Write down the common ratio. (b) Work out the 7th term.	
9 A train travels at a constant speed of 90 km/h. It takes 30 seconds to go completely through a tunnel which is 590 m long. Work out the length of the train, in metres.	
10 A particle moves in a straight line. After t seconds its displacement from a fixed point is s metres, where $s = 2t^3 - 24t^2 + 98t - 1$ (a) Show that the particle is never at rest. (b) Find the least speed of the particle and the time it occurs.	