Day 293	IGCSE 10-a-day
1 A ball is thrown upwards. Its height above the ground, h metres, after t seconds is given by $h = -5t^2 + 40t$ (a) Work out the greatest height reached by the ball. (b) Work out the velocity of the ball when t = 9. State whether it is moving up or down.	
2 Solve $\frac{x-2}{5} + \frac{x+4}{6} = 1$	
3 A curve has equation $y = -x^2 - 3x - 6$. Find the equation of the normal to the curve at the point where x = 0.	
4 The mass of a sample is increased by 100%. By what percentage must the new value be decreased to get back to the original value?	
5 A concrete slab in the shape of a cuboid weighs 660 N. Its smallest face has area 150 cm^2. Its largest face has area 800 cm^2. Pressure = force ÷ area Work out (a) the greatest pressure and (b) the least pressure the concrete slab can exert on the ground, in N/m^2.	

Day 293	IGCSE 10-a-day
6 $n(\xi) = 120$, $n(A) = 37$, $n(B) = 44$ and $n(A \cap B) = 29$. Find $P(A \mid B)$ and $P(B \mid A')$.	
7 $y = \frac{-3x^4 - 6x^2 + 3}{x}$ Find $\frac{dy}{dx}$.	
8 A shop mixes two types of mixed nuts. Type A costs £6.00 per kg and type B costs £12.00 per kg. They are mixed in the ratio A : B = 2 : 4. The mixture is sold for £18.00 per kg. Work out the percentage profit.	
9 A plane leaves an airport P and travels 104 km on a bearing of 145° to Q. (Calculator) It then travels 75 km on a bearing of 070° to R. (a) Work out the distance PR. (b) Work out the bearing of R from P. Give distances to 1 decimal place and the bearing to the nearest degree.	
10 The nth term of a sequence is $4n^2 + 6n - 5$. (a) Show that the difference between the (n + 1)th term and the nth term is 8n + 10. (b) Two consecutive terms of the sequence differ by 146. Find the value of n for the first of these two terms.	