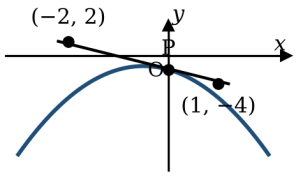
Day 319	IGCSE 10-a-day
1 Factorise fully $4x^2 + 28x + 24$	
2 The 4-digit number 685k is a multiple of 12. k is a single digit. Find all the possible values of k.	
3 A plane leaves an airport P and travels 49 km on a bearing of 045° to Q. (Calculator) It then travels 113 km on a bearing of 125° to R. (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.	
4 The diagram shows part of the curve $y = -2x^2 - 2x - 2$. The line shown is the tangent to the curve at the point P. (Not drawn accurately.) (a) Use the two marked points on the tangent to work out its gradient. (b) Use differentiation to find the x coordinate of P. 	
5 In a group of visitors, 65% are adults and the rest are children. 45% of the adults and 30% of the children buy a souvenir. What percentage of all the visitors buy a souvenir?	

Day 319	IGCSE 10-a-day
6 A particle moves in a straight line. Its displacement from O after t seconds is s metres, where $s = 3t^2 - 8t + 1$ (a) Work out the average velocity of the particle between t = 0 and t = 4. (b) Find the time at which the velocity equals this average velocity.	
7 A bus travels the first half of a journey at 30 km/h. It travels the second half of the same journey at 45 km/h. Work out the average speed for the whole journey.	
8 x and y satisfy $x \geq 0$, $y \geq 0$, $6x + 6y \leq 78$ and $2x + 6y \leq 66$. Find the greatest value of $P = 4x + 9y$ and the values of x and y that give it.	
9 A closed cylinder (a container) has radius r cm, height h cm and total surface area 486π cm^2. (a) Show that its volume, V cm^3, is $V = 243\pi r - \pi r^3$. (b) Find the maximum value of V in terms of π, and show that h = 2r when V is a maximum.	
10 Show that $6 \sin^2 x + 6 \cos^2 x + 1 \equiv 7$.	