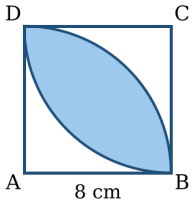
Day 1	IGCSE 10-a-day
1 $f(x) = 2x^3 + 4x - 4$ (a) Find $f'(x)$. (b) Work out the value of $f'(-1)$.	
2 The position vectors of A and P are $\begin{pmatrix} -6 \\ 1 \end{pmatrix}$ and $\begin{pmatrix} -4 \\ 1 \end{pmatrix}$. P lies on AB so that AP : PB = 2 : 3. Find the position vector of B.	
3 $f(x) = 4x + 2$ and $g(x) = \frac{8}{x}$ (a) Find $gf(x)$. (b) Solve $gf(x) = \frac{4}{11}$	
4 A bath is $\frac{1}{10}$ full. 288 more litres of water are added and the bath is then $\frac{9}{10}$ full. Work out the capacity of the bath.	
5 A curve has equation $y = 2x^3 - 12x^2 + 18x - 5$. Find the coordinates of the turning points of the curve. Use the second derivative to determine whether each is a maximum or a minimum.	

Day 1	IGCSE 10-a-day
6 75% of a town's people have been vaccinated. 5% of vaccinated people catch a virus and 3% of unvaccinated people catch it. A person is chosen at random. (a) Work out the probability that the person catches the virus. (b) The person has caught the virus. Work out the probability that they were vaccinated.	
7 ABCD is a square of side 8 cm. BD is an arc of a circle with centre A and an arc of a circle with centre C. Work out the area of the shaded region. Give your answer in terms of π. 	
8 In a group of employees, 75% are men and the rest are women. 45% of the men and 20% of the women work from home. What percentage of all the employees work from home?	
9 The time for a pendulum to swing is directly proportional to the square root of the length of the pendulum. The length of the pendulum is increased by 69%. Work out the percentage change in the time for a pendulum to swing.	
10 The temperature, T °C, of a cup of tea t minutes after it is removed from a heat source is modelled by $T = 20 + \frac{64}{t}$ $(t \geq 1)$ (a) Find $\frac{dT}{dt}$ when t = 4. (b) Find the value of t when the temperature is falling at 4 °C per minute.	