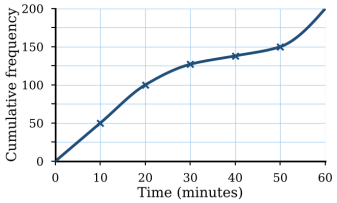
Day 253	IGCSE 10-a-day
1 Write these numbers in order of size, starting with the smallest. 0.32, 85%, 0.89, 50%	
2 The temperature, T °C, of a metal bar t minutes after it is removed from a heat source is modelled by $T = 25 + \frac{80}{t}$ $(t \geq 1)$ (a) Find $\frac{dT}{dt}$ when $t = 2$. (b) Find the value of t when the temperature is falling at 80 °C per minute.	
3 Solve $4x^2 - 5x - 7 = 0$ Give your answers in surd form.	
4 $M = \begin{pmatrix} 1 & 0 \\ 4 & -3 \end{pmatrix}$. (a) Work out the determinant of M. (b) Find M^{-1}.	
5 Jamal sets off at 10:00 and cycles at 8 km/h along a path. Maya sets off from the same place at 10:30 and cycles at 18 km/h along the same path. At what time does Maya catch up with Jamal?	

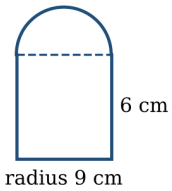
Day 253 **IGCSE 10-a-day**

6 The positive numbers x and y satisfy $x + y = 9$.
Find the greatest possible value of x^2y, showing that it is the greatest.

7 The cumulative frequency graph shows the times, in minutes, taken by 200 runners to finish a race.
(a) Find the median. (b) Find the interquartile range.
(c) How many runners took more than 50?



8 A solid is made from a cylinder of height 6 cm and a hemisphere. Both have radius 9 cm.
Work out the total volume of the solid. Give your answer in terms of π.



9 A curve has equation $y = 2x^3 + x^2 + x$.
Show that y is an increasing function for all values of x.

10 The probability that it rains on a day is 0.3.
If it rains, the probability that Ali is late for school is 0.5.
If it does not rain, the probability that Ali is late is 0.2.
(a) Work out the probability that Ali is late.
(b) Ali is late. Work out the probability that it rained.