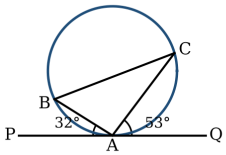
Day 240	IGCSE 10-a-day
1 A curve has equation $y = x^3 + x^2 + 3x - 2$. The tangent to the curve at the point A, where $x = -1$, meets the curve again at the point B. Find the coordinates of B.	
2 The position vectors of A and P are $\begin{pmatrix} -3 \\ 3 \end{pmatrix}$ and $\begin{pmatrix} 3 \\ 12 \end{pmatrix}$. P lies on AB so that AP : PB = 3 : 2. Find the position vector of B.	
3 $y = -4x^{5/2} - 3x^2 - \frac{4}{x^{3/2}}$ Find $\frac{dy}{dx}$. Give each term of your answer in the form ax^n.	
4 Here are the first five terms of a quadratic sequence. 6, 13, 22, 33, 46 Find an expression for the nth term.	
5 A price is increased by 900%. By what percentage must the new value be decreased to get back to the original value?	

Day 240 **IGCSE 10-a-day**

6 PAQ is a tangent to the circle at A. B and C are points on the circle. Angle PAB = 32° and angle CAQ = 53°.
(a) Work out the size of angle ABC.
(b) Work out the size of angle ACB.
The diagram is not drawn accurately.



7 $\mathbf{a} = \begin{pmatrix} -2 \\ 2 \end{pmatrix}$, $\mathbf{b} = \begin{pmatrix} 5 \\ 1 \end{pmatrix}$ and $\mathbf{c} = \begin{pmatrix} 7 \\ -1 \end{pmatrix}$.
$\mathbf{c} = m\mathbf{a} + n\mathbf{b}$.
Find the value of m and the value of n.

8 The normal to the curve $y = x^2 + x - 5$ at the point P where x = 0 meets the curve again at Q.
Find the coordinates of Q.

9 The point P(−1, 5) is reflected in the x-axis.
The image is then reflected in the line y = x.
(a) Write down the coordinates of the final image of P.
(b) Describe fully the single transformation that is equivalent to these two transformations.

10 The table gives information about the times taken by some people to travel to work.
An estimate for the mean is 38.5.
Work out the value of x.

Time, t (minutes)	Frequency
$0 < t \leq 20$	12
$20 < t \leq 40$	x
$40 < t \leq 60$	5
$60 < t \leq 80$	12