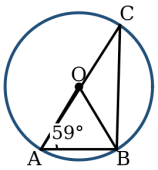
Day 329 **IGCSE 10-a-day**

1 A, B and C are points on a circle, centre O.
Angle OAB = 59°.
(a) Work out the size of angle AOB.
(b) Work out the size of angle ACB.
The diagram is not drawn accurately.



2 The position vectors of A and B are $\begin{pmatrix} -4 \\ -5 \end{pmatrix}$ and $\begin{pmatrix} -1 \\ 8 \end{pmatrix}$.
(a) Write down the vector **AB**.
(b) Find |**AB**|, giving the answer as a surd in simplest form if it is not exact.

3 The curve $y = 2x^2 - 24x + 40$ crosses the x-axis at the points A and B.
(a) Find the coordinates of A and B.
(b) Find the coordinates of the minimum point of the curve.

4 A ball is thrown upwards. Its height above the ground, h metres, after t seconds is given by
$h = -4t^2 + 8t$
(a) Work out the greatest height reached by the ball.
(b) Work out the velocity of the ball when t = 2.
State whether it is moving up or down.

5 A square has sides of length $(5 + \sqrt{2})$ cm.
Work out the area of the square.
Give your answer in the form $a + b\sqrt{2}$

Day 329 **IGCSE 10-a-day**

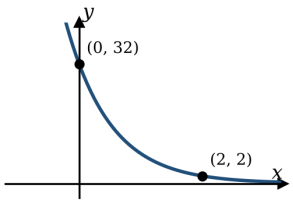
6 The temperature, T °C, of a cup of tea t minutes after it is removed from a heat source is modelled by

$T = 25 + \frac{48}{t}$ $(t \geq 1)$

(a) Find $\frac{dT}{dt}$ when $t = 4$.

(b) Find the value of t when the temperature is falling at 12 °C per minute.

7 The diagram shows part of the graph of $y = ab^x$. The curve passes through (0, 32) and (2, 2).
(a) Find the values of a and b. (b) Work out the value of y when x = 3.



8 The table gives information about 80 times.
Work out an estimate for the median.
Assume the values in each class are evenly spread.

Time, t (minutes)	Frequency
$20 < t \leq 25$	23
$25 < t \leq 30$	13
$30 < t \leq 35$	5
$35 < t \leq 40$	23
$40 < t \leq 45$	16

9 Two curves have equations $y = 2x^2 + 4x - 2$ and $y = x^2 + 12x + 7$.
Find the value of x at which the curves have the same gradient.

10 $f(x) = \frac{3x - 5}{2x - 3}$ where $x \neq \frac{3}{2}$

(a) Show that ff(x) = x.

(b) Write down $f^{-1}(x)$.