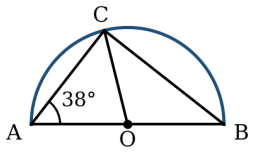
Day 219 **IGCSE 10-a-day**

1 AB is a diameter of a circle, centre O. C is a point on the circle. Angle BAC = 38°.
(a) Work out the size of angle ACB.
(b) Work out the size of angle COB.
The diagram is not drawn accurately.



2 A particle P moves in a straight line. After t seconds its displacement from a fixed point O is s metres, where
$s = -2t^3 + 6t^2 - 11t \ (t > 0)$
Find (a) the velocity of P, (b) the acceleration of P, when t = 2.

3 Write down the matrix that represents each transformation.
(a) Reflection in the line y = x
(b) Rotation of 90° clockwise about the origin

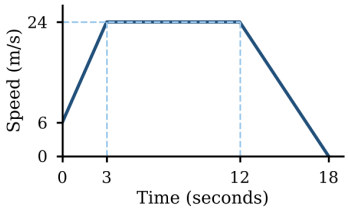
4 $y = 2x^3 + 6x^2 + 9x - 6$
(a) Find $\frac{d^2y}{dx^2}$.
(b) Find the value of x for which $\frac{d^2y}{dx^2} = 0$, and work out the gradient of the curve at this value of x.

5 A right-angled triangle has base $(3 + \sqrt{7})$ cm and height $(3 - \sqrt{7})$ cm.
Show that the area of the triangle is a rational number.
Work out the area.

Day 219 **IGCSE 10-a-day**

6 x and y satisfy these inequalities:
$x \geq 3$, $y \leq 2$, $3x - 4y \leq 13$
Find the greatest possible value of $-3x + 3y$.

7 The graph shows the speed of a train during 18 seconds.
(a) Work out the acceleration during the first 3 seconds.
(b) Work out the average speed over the whole 18 seconds.



8 Solve the simultaneous equations
$y = x^2 + 3x - 1$
$y = 2x + 11$

9 A particle moves in a straight line. After t seconds, its displacement from a fixed point O is s metres, where
$s = -2t^3 + 30t^2 + 3t$ for $t \geq 0$
Find the greatest speed of the particle, and the value of t at which it occurs.

10 Show that $\sqrt{22 + 8\sqrt{6}} = 4 + \sqrt{6}$