Day 32	IGCSE 10-a-day
1 Each interior angle of a regular polygon is 14 times the size of each exterior angle. Work out the number of sides of the polygon.	
2 Work out the exact value of $6 \sin 45° \div \cos 30°$. Give your answer in its simplest form, with no decimals.	
3 $y = 2x^2 + \frac{8}{x^2}$ (a) Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$. (b) Work out the value of $\frac{d^2y}{dx^2}$ when $x = -2$.	
4 A concrete slab in the shape of a cuboid weighs 120 N. Its smallest face has area 100 cm^2. Its largest face has area 2,000 cm^2. Pressure = force ÷ area Work out (a) the greatest pressure and (b) the least pressure the concrete slab can exert on the ground, in N/m^2.	
5 $A = 2^2 \times 3^3 \times 7$ $B = 2^3 \times 7^2$ Write down, as a product of prime factors, (a) the HCF of A and B (b) the LCM of A and B	

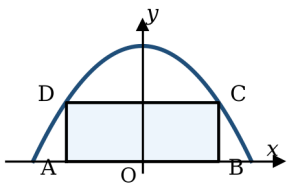
Day 32 **IGCSE 10-a-day**

6 The tangent at the point P on the curve $y = 3x^2 - x$ is perpendicular to the line $x - y = 9$.
Find the coordinates of P.

7 $f(x) = 4x + 2$ and $g(x) = x^2 - 1$
Solve $fg(x) = gf(x)$

8 $A = \begin{pmatrix} 5 & 6 \\ -4 & 3 \end{pmatrix}$.
$A^2 = pA + qI$, where I is the 2 × 2 identity matrix.
Find the value of p and the value of q.

9 The diagram shows the curve $y = 3 - x^2$.
Rectangle ABCD has A, B on the x-axis and C, D on the curve. B is (x, 0).
(a) Show that the area of ABCD is $-2x^3 + 6x$.
(b) Find the maximum area of ABCD, showing that it is a maximum.



10 Solve $5^{2x+1} = \frac{1}{25}$