Day 144 **IGCSE 10-a-day**

1 $A = \begin{pmatrix} 1 & -6 \\ 8 & -1 \end{pmatrix}$ and $B = \begin{pmatrix} 8 & -2 \\ 5 & 2 \end{pmatrix}$.
Find the matrix X such that A + X = B.

2 The ratio of juniors to seniors in a school is 3 : 2.
45% of the juniors and 20% of the seniors play a sport.
What percentage of all of these students play a sport?

3 $y = (4x - 2)^2$
Find $\frac{dy}{dx}$.

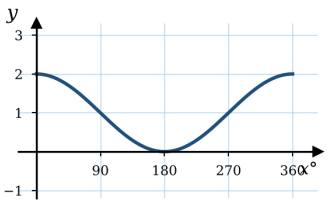
4 The table shows the number of students in each of four groups.
(a) A stratified sample of 30 is taken. Work out how many come from Year 7.
(b) A different stratified sample has 15 from Year 8. Work out the size of this sample.

	Year 7	Year 8	Year 9	Year 10
Number	200	125	225	200

5 Given that $\frac{8^4 \times 32^4}{2^2} = 2^n$,
find the value of n.

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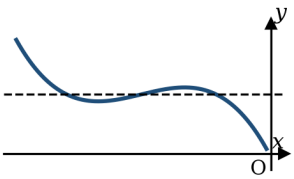
6 The diagram shows the graph of $y = a \cos bx° + c$ for $0 \leq x \leq 360$.
a, b and c are integers.
Find the values of a, b and c.



7 A curve has equation $y = -2x^3 + 54x - 2$.
The point A $(-2, k)$ lies on the curve. Work out the value of k and the gradient of the curve at A.

8 $f(x) = 4x + 3$ and $g(x) = 7x^2 - 3$
(a) Find $fg(x)$.
(b) Solve $fg(x) = 19$

9 The diagram shows a sketch of the curve $y = -x^3 - 9x^2 - 24x - 1$ and the line $y = k$.
The line meets the curve at three different points.
Find the range of possible values of k.



10 ABCD is a rectangle with AB = 17 cm and AD = 13 cm.
A point P inside the rectangle is such that AP ≤ 12 cm and P is nearer to AB than to AD.
Work out the area of the region in which P can lie. Give your answer in terms of π.