Day 34 **IGCSE 10-a-day**

1 Here are six numbers.

$3 + \sqrt{12}, \sqrt{3} \times \sqrt{5}, \sqrt{50}, \sqrt{\frac{9}{16}}, \sqrt{2} + \sqrt{8}, \frac{\sqrt{18}}{\sqrt{2}}$

Write down the irrational numbers.

2 $y = 3x^3 + 6x^2 + 4x$

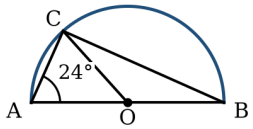
(a) Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$.

(b) Work out the value of $\frac{d^2y}{dx^2}$ when $x = 2$.

3 The table shows how 133 students travel to school.
A person who chose Bus is picked at random.
Work out the probability that this person is in the group "Girls".

	Walk	Bus	Car	Total
Boys	25	23	30	78
Girls	9	19	27	55
Total	34	42	57	133

4 AB is a diameter of a circle, centre O. C is a point on the circle. Angle BAC = 24°.
(a) Work out the size of angle ACB.
(b) Work out the size of angle COB.
The diagram is not drawn accurately.



5 A rectangle has length (3x + 6) cm and width (x + 3) cm.
The area of the rectangle is 330 cm^2.
(a) Show that $3x^2 + 15x - 312 = 0$
(b) Work out the perimeter of the rectangle.

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6 Sofia, Zane and Uma share some money.
Sofia : Zane = 7 : 2
Zane : Uma = 9 : 3
(a) Work out the ratio Sofia : Zane : Uma.
(b) They share £145 altogether. How much money does Sofia get?

7 A curve has equation $y = 2x^3 + 9x^2 + 1$.
The point A (3, k) lies on the curve. Work out the value of k and the gradient of the curve at A.

8 Dina read $\frac{6}{7}$ of a book on Saturday.

On Sunday she read $\frac{1}{4}$ of the pages that were left.
She read 11 pages on Sunday.
How many pages are in the book?

9 The tangent to the curve $y = x^2 + x - 4$ at the point where $x = -1$ meets the axes at A and B.
Work out the area of triangle OAB, where O is the origin.

10 $\mathbf{OA} = \mathbf{a}$, $\mathbf{OB} = \mathbf{b}$, $\mathbf{OP} = \frac{1}{3}\mathbf{a}$ and $\mathbf{OQ} = \frac{3}{4}\mathbf{b}$.
AQ and BP meet at X.
(a) Find $\mathbf{OX}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.
(b) Find the ratio AX : XQ.

