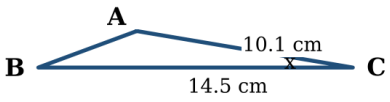
Day 322	IGCSE 10-a-day
1 $y = 2x^5 - 8x^4 - 4x^2$ (a) Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$. (b) Work out the value of $\frac{d^2y}{dx^2}$ when $x = -2$.	
2 The ratio of boys to girls in a school is 4 : 1. 80% of the boys and 50% of the girls walk to school. What percentage of all of these students walk to school?	
3 A company sells x thousand items each month. The price of each item is £40 − 4x. The monthly revenue is £R thousand. (a) Show that $R = 40x - 4x^2$. (b) Find the maximum monthly revenue, showing that it is a maximum.	
4 Two cones, P and Q, are mathematically similar. The volume of P is 16 cm^3 and the volume of Q is 250 cm^3. The curved surface area of P is 24 cm^2. Work out the curved surface area of Q.	
5 The area of triangle ABC is 12.1 cm^2. Angle C is acute. Work out the size of angle C. Give your answer correct to 1 decimal place. (Calculator)  	

Day 322 **IGCSE 10-a-day**

6 Fatima puts £1,500 in a savings account.
Compound interest is paid at 4% in year 1, 6% in year 2 and 5% in year 3.
Work out the amount in the account at the end of year 3.
Give your answer to the nearest penny.
(Calculator)

7 OA = $\mathbf{a}$ and OB = $\mathbf{b}$.
OP = $3\mathbf{a} + 4\mathbf{b}$, OQ = $6\mathbf{a} - 8\mathbf{b}$ and OR = $10\mathbf{a} - 24\mathbf{b}$.
(a) Show that P, Q and R lie on a straight line.
(b) Work out the ratio PQ : QR in its simplest form.

8 $f(x) = 3x^3 + \frac{144}{x}$
Find the values of x for which $f'(x) = 0$.

9 $A = \begin{pmatrix} 4 & 1 \\ 3 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} 19 \\ 21 \end{pmatrix}$.
AX = B, where X is a 2 × 1 matrix.
Find X.

10 Solve $\frac{3}{x+1} + \frac{2}{x-2} = 2$