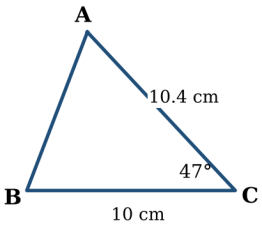
Day 108	IGCSE 10-a-day
1 $y = -6x^{5/2} + 3x^2 - \frac{6}{\sqrt{x}}$ Find $\frac{dy}{dx}$. Give each term of your answer in the form ax^n.	
2 $A = \begin{pmatrix} 7 & 2 \\ -2 & 7 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & 3 \\ 0 & 1 \end{pmatrix}$. Find the matrix X such that A + X = B.	
3 Solve $9x^2 + 10 = 21x$	
4 A concrete slab in the shape of a cuboid weighs 510 N. Its smallest face has area 100 cm^2. Its largest face has area 500 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 30% increase followed by a 25% decrease is equivalent to a single percentage change. Work out the single percentage change that has the same effect.	

Day 108 **IGCSE 10-a-day**

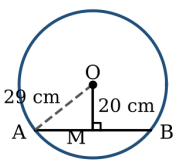
6 The lengths of the sides of a right-angled triangle are $(x - 7)$ cm, $(x - 8)$ cm and $(x - 6)$ cm.
The longest side is $(x - 6)$ cm.
(a) Show that $x^2 - 18x + 77 = 0$
(b) Hence work out the area of the triangle.

7 Work out the area of triangle ABC.
Give your answer correct to 3 significant figures. (Calculator)



8 An open box has a square base of side x cm and height h cm. The total outside surface area is 108 cm^2.
(a) Show that the volume of the box is $V = \frac{1}{4}(108x - x^3)$ cm^3.
(b) Find the maximum volume of the box, proving that it is a maximum.

9 AB is a chord of a circle, centre O. M is the midpoint of AB. (Calculator)
(a) Work out the length of the chord AB.
(b) Work out angle AOB, to 1 decimal place.
The diagram is not drawn accurately.



10 $y = -2x^3 + 6x^2 + 18x - 4$
(a) Show that there is a stationary point at $x = 3$.
(b) By finding the gradient when $x = \frac{5}{2}$ and when $x = \frac{7}{2}$, decide whether it is a maximum or a minimum.