Day 78	IGCSE 10-a-day

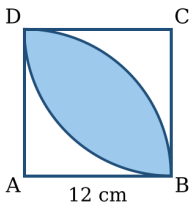
1 The graph of $y = 2x^2 - 4x + 2$ has a turning point at P.
Find the equation of the tangent to the curve at P.

2 A circular arc has a chord AB of length 18 cm.
The greatest distance between the chord and the arc is 3 cm.
Work out the radius of the circle.

3 $y = \dfrac{5x^3 + 4x}{x}$

Find $\dfrac{dy}{dx}$.

4 ABCD is a square of side 12 cm.
BD is an arc of a circle with centre A and an arc of a circle with centre C.
Work out the area of the shaded region. Give your answer in terms of π.



5 $\mathbf{OA} = 4\mathbf{a} - \mathbf{b}$, $\mathbf{OB} = 6\mathbf{a} - 4\mathbf{b}$ and $\mathbf{OC} = 5\mathbf{b}$.
Show that A, B and C lie on a straight line.

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6 A house price increases by 400%. What percentage decrease would take it back to its original value?	
7 $\mathbf{p} = \begin{pmatrix} -7 \\ 24 \end{pmatrix}$. Find a vector of length 75 that is parallel to $\mathbf{p}$.	
8 A is the point $(-2, -2)$ and B is the point $(8, 2)$. Find an equation of the perpendicular bisector of AB. Give your answer in the form $y = mx + c$.	
9 Given that $x > 0$, solve $x^{\frac{5}{4}} = 32$	
10 A piece of thin metal rod 28 cm long is cut into two pieces. One piece is bent to form a square of side x cm. The other piece is bent to form a rectangle whose length is three times its width. (a) Show that the total area, A cm^2, enclosed by the two shapes is $A = x^2 + \frac{3(28 - 4x)^2}{64}$. (b) Find the value of x for which A is least, and work out this least area.	