Day 60	IGCSE 10-a-day
1 A rectangle has length 7.9 cm and width 4.2 cm, both correct to 1 decimal place. Work out the lower bound of the area of the rectangle.	
2 A particle P moves in a straight line. After t seconds its displacement from a fixed point O is s metres, where $s = 2t^2 + 4t + 4 + \frac{8}{t}$ $(t > 0)$ Find (a) the velocity of P, (b) the acceleration of P, when t = 2.	
3 f(x) = 4x + 3 and g(x) = kx − 4, where k is a constant. fg(x) = gf(x) for all values of x. Find the value of k.	
4 The area, A cm^2, of a circle of radius r cm is $A = \pi r^2$. (a) Find $\frac{dA}{dr}$ when r = 3. (b) Find the value of r when $\frac{dA}{dr} = 4\pi$.	
5 Use the iteration formula $x_{n+1} = \sqrt{5x_n + 11}$ with $x_0 = 1$ (Calculator) to work out x_1, x_2 and x_3. Give each answer correct to 3 decimal places.	

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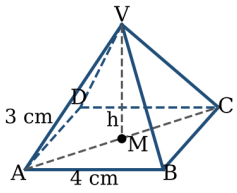
6 A company sells x thousand items each month.
The price of each item is £4 − x.
The monthly revenue is £R thousand.
(a) Show that $R = 4x - x^2$.
(b) Find the maximum monthly revenue, showing that it is a maximum.

7 The table gives information about 116 times.
Work out an estimate for the median.
Assume the values in each class are evenly spread.

Time, t (minutes)	Frequency
$10 < t \leq 30$	5
$30 < t \leq 50$	29
$50 < t \leq 70$	30
$70 < t \leq 90$	24
$90 < t \leq 110$	28

8 $g(x) = x^2 + 4x + 13$ for $x \geq -2$.
(a) Find the range of g.
(b) Find $g^{-1}(x)$.

9 VABCD is a pyramid on a square base. V is directly above the centre M.
(a) Work out the height VM of the pyramid.
(b) Work out the volume of the pyramid.
The diagram is not drawn accurately.



10 $N = 2 \times 5^5$
How many factors does N have?
Include 1 and N.