Day 252	IGCSE 10-a-day
1 A particle P moves in a straight line. After t seconds its displacement from a fixed point O is s metres, where $s = 2t^3 + 2t^2 + 5t + 2$ $(t > 0)$ Find (a) the velocity of P, (b) the acceleration of P, when $t = 4$.	
2 Simplify fully $\frac{2x^6y^2 \times 3x^5y^4}{2x^3y^3}$ Give your answer in the form kx^ay^b	
3 The ratio of juniors to seniors in a school is 1 : 3. 50% of the juniors and 30% of the seniors play a sport. What percentage of all of these students play a sport?	
4 Work out the exact value of $\tan 60° \div \cos 30°$ Give your answer in its simplest form, as a fraction or surd. Do not use a calculator.	
5 $y = 3x^4 + 2x^3 - x + 5$ The curve crosses the y-axis at the point A. Work out the coordinates of A and the gradient of the curve at A.	

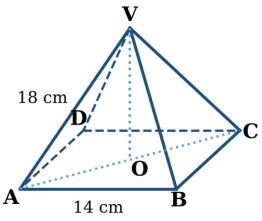
Day 252	IGCSE 10-a-day

6 $f(x) = 2x + 4$ and $g(x) = 2x^2 - 4x + 4$.
(a) Find $f^{-1}g(x)$.
(b) Work out $f^{-1}g(2)$.

7 Solve $3^{2x-1} = 9^{2x+3}$

8 The volume of a cube is directly proportional to the cube of the length of its edge.
The length of its edge is increased by 10%.
Work out the percentage change in the volume of a cube.

9 VABCD is a pyramid. The base ABCD is a square with sides of 14 cm.
The vertex V is vertically above the centre O of the base. VA = 18 cm.
(a) Work out the vertical height VO.
(b) Work out the angle between VA and the base. (Calculator)



10 A curve has equation $y = ax^2 + \frac{b}{x}$, where a and b are constants.
The point $(1, -5)$ lies on the curve and the gradient of the curve at this point is 2.
Find the values of a and b.