Day 306	IGCSE 10-a-day
1 The curve $y = -2x^2 - x - 4$ crosses the y-axis at the point A. The tangent to the curve at A meets the x-axis at B. Find the coordinates of B.	
2 A flight leaves London at 22:15 (London time). It takes 12 hours 30 minutes. When it is 12:00 in London it is 21:00 in Sydney. At what time, in Sydney time, does the flight land? Say if it is on a different day.	
3 $f(x) = -3x^3 - 4x^2 - 4$ (a) Find $f'(x)$. (b) Work out the value of $f'(-2)$.	
4 Solve $\tan x = -\sqrt{3}$ for $0° \leq x \leq 360°$. Do not use a calculator.	
5 An alloy contains 146 g of tin and 178 g of nickel. The density of tin is 7.3 g/cm^3. The density of nickel is 8.9 g/cm^3. Work out the density of the alloy.	

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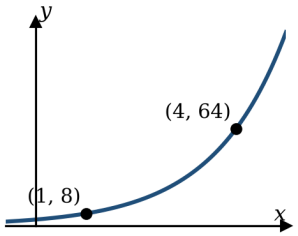
6 $f(x) = 2x - 7$ and $g(x) = \frac{12}{x}$

(a) Find gf(x).

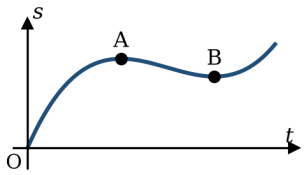
(b) Solve $gf(x) = \frac{12}{5}$

7 p = 11 and r = 6.2, each correct to 1 decimal place.
q = 1.31, correct to 2 decimal places.
Work out the lower bound of $\frac{p - q}{r}$. Give your answer correct to 3 significant figures.
(Calculator)

8 The diagram shows the graph of $y = ka^x$, where k and a are constants and a > 0.
The curve passes through the points (1, 8) and (4, 64).
Find the value of k and the value of a.



9 The diagram shows the graph of $s = 2t^3 - 18t^2 + 48t$, the displacement in metres of a particle P from O after t seconds.
P changes direction at A and B. Work out the total distance travelled in the first 5 seconds.



10 $A = \begin{pmatrix} 0 & -4 \\ -2 & -3 \end{pmatrix}$.

$A^2 = pA + qI$, where I is the 2 × 2 identity matrix.
Find the value of p and the value of q.