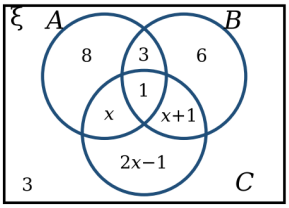
Day 107	IGCSE 10-a-day
1 $y = -3x^4 - 8x^3 - 6x - 2$ Find $\frac{dy}{dx}$	
2 A red light flashes every 12 minutes. A blue light flashes every 15 minutes. A green light flashes every 20 minutes. They all flash together at 6:00 am. (a) At what time do they next flash together?	
3 $f(x) = 3x + 3$. (a) Find $f^{-1}(-3)$. (b) Express $ff(x)$ in the form $px + q$.	
4 R is 50% less than Q. Q is 12% more than B. Work out R as a percentage of B.	
5 Triangle P has vertices A(1, 4), B(3, 2) and C(−2, 4). Triangle Q has vertices A'(3, 7), B'(7, 3) and C'(−3, 7). Q is an enlargement of P. Describe fully the single transformation that maps P onto Q.	

Day 107 **IGCSE 10-a-day**

6 The Venn diagram shows information about 45 shoppers.
A: bought fruit B: bought bread C: bought milk
(a) Find the value of x.
(b) Find n(A) and n(B ∪ C)′.



7 The nth term of a sequence is $n^2 + 4n - 6$.
(a) Work out the 12th term.
(b) Is 249 a term of the sequence? You must show your working.

8 A particle moves in a straight line. Its velocity, v m/s, at time t seconds is given by
$v = 6t - t^2$ for $0 \leq t \leq 6$
Find the time at which the speed of the particle is greatest, and this greatest speed.

9 Liam invested £10,000 in a savings account for 2 years.
Compound interest was paid at a fixed rate per year.
At the end of the 2 years the account held £11,236.
Work out the annual rate of interest.
(Calculator)

10 The curve C has equation $y = -x^2 - 4x - 3$.
The points A and B on C have x coordinates 0 and 3.
The tangents to C at A and at B meet at the point T. Find the coordinates of T.