

Algebra and number theory

1. Ann and Bob together has the same amount money as Dan. Ann and Dan together has twice as much money as Bob. How many times more money has Bob and Dan together as Ann?
2. $x+y = x \cdot y = x/y$. Find x and y .
3. There is a heap of sweets. First Lillebror eats one of the sweets, then Karlsson eats two 2 sweets, then Lillebror eats three, Karlsson eats four, and so on. If the heap contains less sweets than someone (a boy or Karlsson) has to eat next turn, then he eats the rest part of sweets from the heap. It turned out that Lillebror ate 101 sweets. How many sweets were in the heap at the beginning of a meal?
4. A three-place positive integer is divided into sum of its digits. Find the maximal value of possible residue.
5. On the cube sides were written positive integers. Then at each corner have been written the product of three integers from adjacent sides. The sum in the corners is 1001. Find the sum on the sides.
6. Replace coefficients a, b, c, d, k, l, m in the equations $y=ax+k$, $y=bx+l$, $y=cx+m$, $y=dx$ with 7 different prime numbers to get equations for 4 lines which all goes through a common point.
7. Given three numbers. If one would increase each number with 1, then the product would increase also with 1. If one instead would increase each number with 2, then the product would increase also with 2. In fact each number had been increased with 3. Find the increment of the product.