

Solutions & Homework 2

Anton Lykov

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1 Solutions

Solution 1.

Yes, this is possible. For example, suppose the companies had 60, 35, and 20 shops. After the first day, the Company 1 will be left with 12 shops. After the second day, Company 2 will be left with 7 shops, and after the third day, Company 3 will be left with 4 shops.

Solution 2.

2000. Note that $2019 = 3 * 673$, and both 3 and 673 are primes. Moreover,

$$n^2 + 20n + 19 = (n + 1)(n + 19)$$

As 2019 is divisible by 3, one of the factors $(n + 1)$ and $(n + 19)$ must be divisible by 3. Since the difference between them is divisible by 3, both of them must be divisible by 3. Moreover, one of them also has to be divisible by 673, which means that this number has to be divisible by $3 * 673 = 2019$. The smallest n for which this condition holds is 2000.

2 Homework

Problem 1.

Calculate the probability of randomly rearranging tiles with the letters of CIRCLE and getting a word starting with a vowel.

Problem 2.

Describe the sample space of rolling a 6-sided die twice. Which numbers can we possibly get as a sum of two rolls? What is the probability that each number will be this sum (i.e., for each of the possible numbers, write down the probability of getting it)? Which number is the most/least likely to appear?