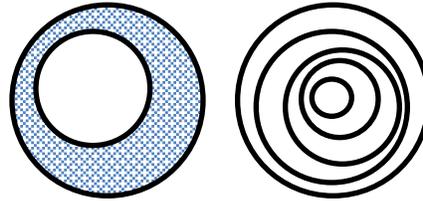


1 Today Alice ate 3 fewer candies than yesterday, and twice as many cookies as yesterday. But the total number of candies and cookies she ate today was the same as yesterday. How many cookies did Alice eat today?

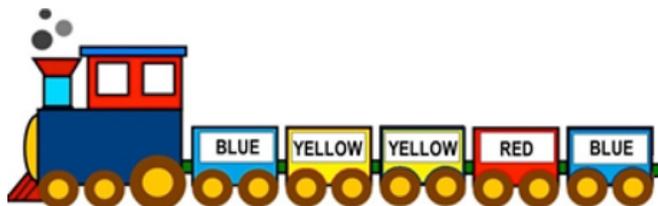
2 A ring is a flat shape formed by an inner circle and an outer circle, as shown in the first diagram. How many rings of all sizes and types are there in the second diagram containing five circles?



3 John took two different digits and using them wrote two different 2-digit numbers (each number uses both digits). The sum of these 2-digit numbers is also a 2-digit number. What is the greatest possible value of the smaller of the written numbers?

4 A metal letter R weighs 2 pounds, a metal letter S weighs 1 pound, and a metal letter M weighs 4 pounds. A certain 10-letter "word" containing only the metal letters R, S, and M can be split into three groups of letters weighing 9 pounds per group. How many letters M are in this word?

5 In a very long toy train, the first and last cars were blue. After each blue car (except the last one), there were two yellow cars. After each pair of yellow cars, there was a red car. After each red car, there was a blue car. The first five train cars are shown in the picture. Oleg picked a car and recolored all cars in front of it green. Then Joyce picked a car and recolored all cars behind it green. What is the greatest possible number of non-green cars in the recolored toy train if it contains 7 more yellow cars than blue cars?



6 Find the largest 6-digit multiple of 11 such that the sum of all its digits equals 40.

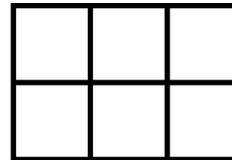
Please fold over on line. Write answers on back.



7 The Treasury wants to reduce usage of coins and is considering several silly proposals: devalue a quarter by $X\%$ compared to a penny, raise a dollar by $X\%$ compared to a penny, and make a dollar worth 6 quarters. If it decides to implement all three proposals, without any other explicit changes (so a penny is still worth 1 cent, and a dime is still worth 10 cents), how many dimes would be in a dollar?

8 Anna really likes numbers and decided to collect them. She started her collection from the number 1001, which was a birthday gift from RSM. After that, every week Anna added one more new number to the collection by selecting the smallest counting number not yet in the collection that was relatively prime to all the numbers already in the collection. What number was added to Anna's collection on week 10? Note that after 10 weeks the collection contained 11 different numbers.

9 How many different ways are there to place six different digits from 1 to 6 inside the six square cells of a 2-by-3 grid (one digit per cell) such that for every pair of consecutive digits (such as 3 and 4) their square cells share a side?



10 All possible diagonals drawn from the two adjacent vertices A and B of a regular hectogon divide the hectogon's interior into a number of non-overlapping shapes - triangles and quadrilaterals (without any part of a line inside them). How many of these shapes are triangles? (A hectogon is a polygon with 100 sides.)

11 There are eight different cards (four red and four blue) with the digits 2, 0, 1, 7 on them. Each card has exactly one digit, and each of these digits is on exactly two cards (one red and one blue). How many different ways are there to put all eight cards in a row with digits face up and right-side up such that every card appears right next to another card with the same digit?

12 A teacher asked her students to find a 2-digit whole number which has as many as possible different positive factors. Jen realized that there was more than one such number, and listed each of them once. Find the sum of all of Jen's numbers.

Please fold over on line. Write answers on back.