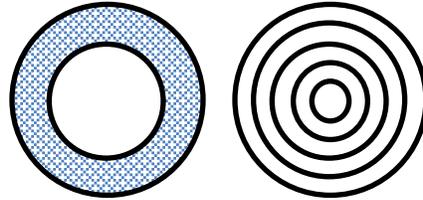


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1 A princess is riding a horse. A bird is on her shoulder. The three of them together have how many more legs than heads?

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?

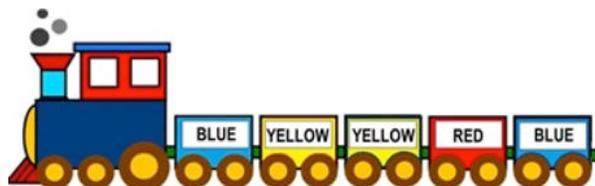


3 Mary and Jack are standing in line. Mary is the second in line, and Jack is the third from the end. There are 12 people in front of Jack. How many people are in line behind Mary?

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

5 Yesterday Alice ate several candies and cookies, for a total of 12. Today she ate 3 fewer candies than yesterday, and twice as many cookies as yesterday, for a total of 14. How many candies did Alice eat yesterday?

6 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 least possible number of non-green cars in the recolored toy train if it contains 7 more yellow cars than blue cars?



Please fold over on line. Write answers on back.

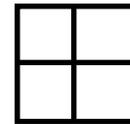
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7 Ilya wrote the counting numbers from 1 to 50. He started this way: 123456789101112, and stopped when he wrote 50. How many odd digits did he write?

8 Anna really likes numbers and decided to collect them. She started her collection from the number 35, 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 which was neither a multiple nor a factor of any number 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.

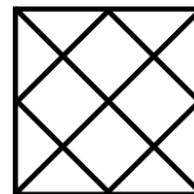
9 How many different ways are there to place four different digits from 1 to 4 inside the four square cells of a 2-by-2 grid (one digit per cell) such that for every pair of digits that are 1 apart (such as 2 and 3), their square cells share a side?



10 There are several balls in the RSM Sport Center. At least one of the balls is \$1 cheaper than another one. At least one of the balls is \$2 cheaper than another one. At least one of the balls is \$3 cheaper than another one. At least one of the balls is \$4 cheaper than another one. At least one of the balls is \$6 cheaper than another one. At least one of the balls is \$7 cheaper than another one. What is the least possible number of balls in the RSM Sport Center?



11 How many more triangles (of all sizes and positions) than squares (of all sizes and positions) are there in the diagram?



12 There are six different cards (three red and three blue) with the letters R, S, M on them. Each card has exactly one letter, and each of these letters is on exactly two cards (one red and one blue). How many different ways are there to put all six cards in a row with letters face up and right-side up such that every card appears right next to another card with the same letter?

Please fold over on line. Write answers on back.