Math Challenge #8

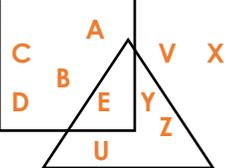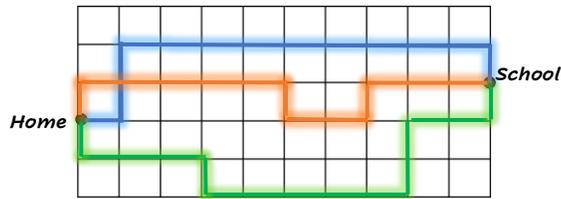| First Name: _____	Last Name: _____	Grade: _____
Teacher: _____	Parent's email: _____	

Reasoning and Logic

Welcome to the Math Challenge #8. Problems in this challenge can be solved by mathematical reasoning and logical thinking. In most cases, we can solve by reading the problems carefully, organize information that we find in the problem, and find conclusions that are critical to solving the problem.

If you are new to any of the problem solving strategies, check out our complete overview of elementary problem solving strategies at https://www.mathinaction.org/problem-solving-strategies.html.

Kinder & First Grade: solve at least 3 problems.
Second & Third Grade: solve at least 7 problems.
Fourth Grade and above: solve at least 12 problems.

Answer

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1.	Roselea has a secret number with the following clues: • It is more than the sum of 1, 2, and 3. • It is an even number. • It is less than the sum of 5 and 5. What is Rosealea's secret number?	
2.	Dad, Lucy, and Dalton have their own pets (a fish, a cat, and a dog). Use the following clues to find each one's pet. • Dad's pet is often found crying on a tree. • Dalton's pet digs holes in the yard for his/her bone.	
3.	Which letters are in the triangle but not in the square?	
4.	Which route from home to school is longer, the blue one, the green one, or the orange one?	
5.	Five children took part in a 100-meter race. Amelia finished before Bella but behind Colton. Doris finished before Eddy but behind Bella. Who finished first?	
6.	Some pages are missing from an open book. On the left page, you can see page 12, and on the right page you can see page number 25. How many double-sided sheets are missing?	

7.	Tina's birthday was last week. It was the day she had a math test at school. It was also a few days after her Monday's weekly soccer practice. The day after the math test, her math teacher shared the test result in class and that was the end of the week. What day was Tina's birthday?	

| 8.	Three friends buy an all-day pass to ride a two-seater bike. If only two of them can ride at a time, how many possible seating arrangements are there?	

| 9.	Marissa has cats, dogs, and parrots. Including Marissa, there are 28 feet and 10 wings. Each parrot has two wings and two feet; each cat has four feet; each dog has four feet; each person has 2 feet. If Marissa has the same number of cats as dogs, how many cats does she have?	

| 10.	A square measuring 50 cm by 50 cm is partitioned into five rows of five congruent squares as shown below. The small squares are alternately shaded as shown in the picture. Find the total area of the shaded part of the whole square.	
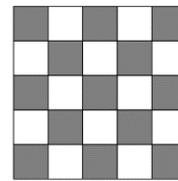
11.	Justin opens his math textbook and multiplies the two consecutive page numbers. What is the sum of these two page numbers if their product is 930?	
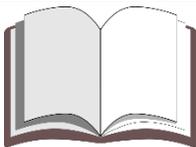
12.	You are given the numbers 1, 2, 3, 4, and 5. Arrange the numbers on the circles so that consecutive numbers are not connected by orange lines. How many ways can this be done?	
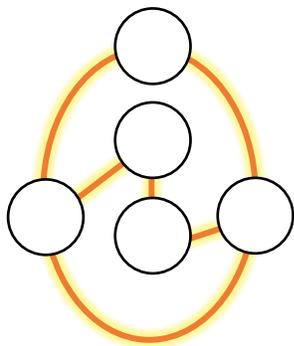
13.	In a row of people, Rachel is standing at 7th position from front, and Monica is standing at 10th position from back. If Rachel and Monica interchange their positions, Monica becomes 20th from back. How many people are there in the row ?	

14.	Each unique letter represents a unique digit. In other words, the same letter represents the same digit, different letters represent different digits. What number does KATE represent?	
	$\quad\quad$ **T A K E** $\quad\quad\quad\quad\quad\quad$ **A** $\quad$ **+ C A K E** $\quad\quad\quad$ **K A T E**	

15.	Cal and Ender have Math Club every Monday. At the most recent meeting, their teacher gave them a very unusual number pattern that they were unable to solve. Can you help them find the next number in the following sequence? 2, 9, 16, 23, 30, 7, 14, 21, 28, … The next number is _____.	

16.	Suppose ABCD is a rectangle with two identical regular hexagons. If the area of one hexagon is 6 cm², then find the area of the rectangle, in cm².	
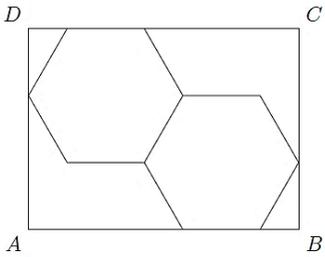
17.	When an empty jar is filled with water, it weighs 6 pounds. When $^3/_7$ of the water is poured out, the jar weighs 4 pounds. What is the weight of the empty jar in pounds?	

18.	Natalia has 75 colored beads. She groups them by color. The average number of beads per color is 15. Twenty beads are sea-green. Each pile has a different number of beads. What is the greatest possible number of golden beads?	

Solution is available on February 4, 2022, at www.mathinaction.org