1.a
- With a 7-minute hourglass and an 11-minute hourglass, find the simplest way to time the boiling of an egg for 15 minutes.

1.b
- Three backpackers cooked rice for dinner. The first one gave 400g of rice and the second 200g of rice. The third one did not have any rice so he gave $6 to the other two. How should they divide the $6 in a fair way (assume they equally shared the dinner)?

1.c
- Mr. White, Mr. Green, and Mr. Brown have at least one boy each and in total six children: five boys and one girl. Bill has one child more than Mr. Green. Greg has as many children as Walter and Bill. Mr. Brown has as many boys as Mr. Green. What is the first name of each man? How many boys and girls does each man have?

1.d
- Three cats catch three rats in three minutes.

How long will it take them to catch 100 rats?
1.e  
- Mr. White sold his sailing boat to Mr. Brown for $10,000. A few weeks later, Mr. Brown discovered that the boat did not live up to his expectation and - being very disappointed - sold the boat back to Mr. White for $9,000. A few weeks later, Mr. White sold his boat again, this time to Mr. Green, for $9,500.

What was Mr. White's total profit?

1.f  
- There are six matches on the table. Your task is to construct four equilateral triangles where the length of each side is equal to the length of a match.

1.g  
- There are twelve matches; each of them is of the same length. You can arrange these matches in various polygon shapes, with each polygon having some area. Now the problem is to use all 12 matches (the entire length of each match must be used) to build a polygon with an area of 4.

1.h  
- Connect the 9 dots with the smallest number of straight lines without lifting your pen from the paper.
2.a
• An ant is placed at one end of a rubber string; this rubber string is one kilometer long. The ant starts walking on the string towards the other end with constant speed of one centimeter per second. At the end of each second the string is stretched so its length is extended by an additional kilometer.

Here we assume that the string can be stretched indefinitely and that the stretching is uniform. Units of length and time remain constant.

Does the ant ever reach the end of the string?

2.b
• A farmer sells 100kg of mushrooms for $1 per kg. The mushrooms contain 99% moisture. A buyer makes an offer to buy these mushrooms a week later for the same price. However, a week later the mushrooms would have dried out to 98% of moisture content. How much will the farmer lose if he accepts the offer?

2.c
• A boy, a girl, and a dog are on the same spot on a straight road. The boy and the girl walk forward - the boy at 4 km/h, the girl at 3 km/h. As they proceed the dog trots back and forth between them at 10 km/h. We assume that each reversal of its direction is instantaneous. An hour later, where is the dog? Which way is it facing?
2.d

- Find the solution for the following: A boat is being carried away by a river’s current. A man jumps out from the boat and swims against the current for some time. Then he turns around and swims with the current until he gets back to the boat. *Did he spend more time swimming against the current or catching up with the boat?*

- Discuss the solution. Are you sure that your solution is correct? Try to provide a convincing argument.

2.e

- Divide the box below into 4 equal pieces.

- Divide the shaded portion of the figure below into 4 equal pieces.

- Divide the white portion of the figure above into 5 equal pieces.
3.a
- The cost of the entrance ticket to an amusement park was reduced; as a result, the park experienced a 50% increase in the number of people coming in. At the same time, the profits from ticket sales increased by 20%. By what percentage was the price of the ticket reduced?

3.b
- A farmer buys 100 live animals: chickens, goats, and sheep and spends $1,000. How many of each does he buy if chicken cost $5 each, goats cost $35 each, and sheep cost $100 each?

3.c
- Mr. White, Mr. Green, and Mr. Black took part in an athletic competition (they were the only participants). There were a few events during the competition and for every event the winner was awarded g points, the runner-up: s points, and the last competitor (i.e. a competitor who took third place): b points. Of course, g > s > b > 0, and all these numbers were integers.

There were no ties. Mr. White’s total for all the events was 22 points and the totals of Mr. Green and Mr. Black were the same at 9 points each. Mr. Green won the long jump. Who was second in the 400 meter race?
3.d
• Miss Brown said: “I have many brothers and sisters. I myself am the 6th child and the number of my brothers is at least as large as the number of my sisters.” Her younger brother added: “And I have at least twice as many sisters as brothers.”

How many boys and girls are there in the Brown family?

3.e
• A boy is often late for school. When approached by his teacher, he explained that it is not his fault. Then he provided some details. His father takes him from home to the bus stop every morning. The bus is supposed to leave at 8:00 a.m., but this departure time is only approximate. The bus arrives at the stop anytime between 7:58 and 8:02 and immediately departs. The boy and his father try to arrive at the bus stop at 8:00, however, due to variable traffic condition they arrive anytime between 7:55 and 8:01. This is why the boy misses the bus so often. Can you determine how often the boy is late for school?

3.f
• There are two cities, A and B that are 400 km apart. Simultaneously, a train leaves city A going toward city B with a constant speed of 40 km per hour, and another train leaves city B going toward the city A with a constant speed of 60 km per hour. Also, at the same time, a busy bee that was resting at the front of the first train starts an interesting trip. It flies with a constant speed of 75 km per hour toward the second train, and as soon as it touches the second train, it reverses the direction of its flight. The bee does this every time it meets a train. If the bee flies this way until the two trains meet, what is the total distance traveled by the bee?