Math Olympiad for 5th Grade

Your Name					
Grade		School			
Phone No.			City		
E-mail					

Part A

Only the answer is needed for each problem.
No solution is needed.

1. Put the digits 2, 7, 1, 2, 0, 1, 9 into the cells below so that the product of the obtained numbers is as large as possible:

☐☐☐☐ x ☐☐☐

2. Rostik is learning how to play percussion, and this is how he practices: he hits the barrel every 10 seconds, hits the plate every 4 seconds, and hits the drum every 7 seconds. He started by striking the barrel and plate at the same time, and after 3 seconds he added the drum. He played for four minutes. How many times during this time did he simultaneously hit the barrel, the plate and the drum?

Answer: _____ раз(а)

3. Nikita started with a correct equality and replaced the same digits with the same letters, and different digits with different letters. He obtained the following rebus:

М + А + Т + Е + М + А + Т + И + К + А = ЕЕ

What is the largest possible digit that could be replaced by E?

Answer: _____

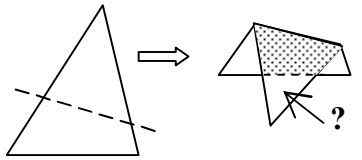
4. Yan wrote down all numbers from 1 to 50 in a row without any intervals between them. Then he found the five numbers that appear most frequently in this sequence, and crossed them out. What is the A) first digit, B) last digit in the new sequence?

Answer: A) _____ B) _____

5. Draw 6 points and connect them with segments so that 4 segments intersect at each of these points and there are no other points of intersection.

Answer:

6. A line divides a paper triangle into two parts of equal area. When we folded the triangle along this line, it turned out that the area of the "two-layer part" (gray in the figure) is equal to the area of the "single-layer part" and 6 cm^2 less than the area of the original triangle. What is the area of the lower small triangle?

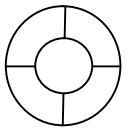


Answer: _____ cm^2

7. When it is noon in Belgrade, it is 11 p.m. in Kamchatka. At the same time it is 6 a.m. in Boston and 3 a.m. of the same day in Los Angeles. On January 10th, at 8 p.m., Misha sent a photo via e-mail from Boston to Vova who was in Belgrade (photos are delivered by e-mail almost instantly). 14 hours later Vova sent it by e-mail to Rodion (he lives in Kamchatka). Next morning at 8 a.m. Rodion sent it to Grisha who stayed in Los Angeles, also by e-mail. At what time and what date did Grisha receive it?

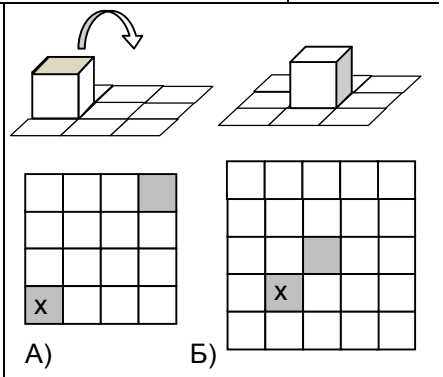
Answer: date: _____ time: _____

8. The brim of the witch's hat is divided into four sectors. Each of them can be painted either blue or red. The store has hats with all possible designs. How many different hats are there?



Answer: _____

9. One of the six faces of a cube is painted in gray. When the cube touches the paper with this face, it colors the paper with gray color. Sam rolls the cube over the edge on the checkered plane without getting into the same cell twice. Draw the routes of the cube that can be used to obtain each picture on the right, if the cube starts from the cell marked with a cross with its gray face touching the paper.



10. In "false checkers", two players put either black or white pieces on the board one after another. If a player puts a white piece, she must tell the truth; if she puts a black one, she must lie. There is one checker on the board. Petya put another piece and said: "Now there are more black pieces on the board than white ones." What color was the first piece?

Answer: _____