Renert Rabbit

Instructions:

1. Do not open this booklet until you are told by your teacher to begin.

2. Materials: pencil, paper — no other materials. NO calculators!

3. You will have exactly **60 minutes** to work on the contest.

4. This is a multiple-choice contest. Each question is followed by five possible answers marked A, B, C, D, and E. Only one of the options is correct. After making your choice, fill it in the appropriate circle on the response form.

5. This form has 9 questions in Part A, 9 questions in Part B, and 5 questions in Part C.

6. Scoring:

   - Each correct answer is worth:
     - 3 points in Part A,
     - 4 points in Part B,
     - 6 points in Part C.
   - Each unanswered question is worth 1 point.
   - Incorrect answers are worth 0 points.

Part A (3 points each)

1. Which number is the largest?

   (A) 89989   (B) 989.99   (C) 89899   (D) 9999.99   (E) 89898

2. In the picture you see the footprints of a cat, a penguin, and a grizzly bear. How many toes do 3 cats, 5 penguins, and 2 grizzly bears have?

   4 toes   3 toes   5 toes

   Cat   Penguin   Grizzly Bear
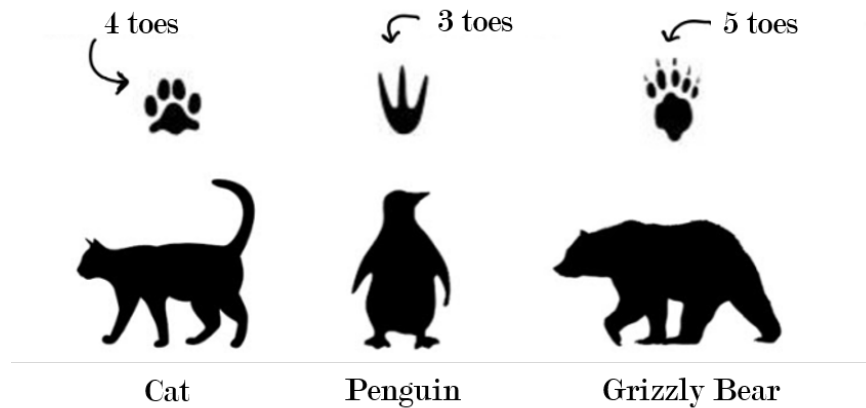
   (A) 74   (B) 98   (C) 104   (D) 118   (E) 124

3. What is $300 - 100 + 100 \div 5 \times 2$?

   (A) 30   (B) 100   (C) 120   (D) 210   (E) 240

4. Michelle drew some straight lines and some curved lines. When she looked at what she drew, she found two triangles, one square, and three circles. What is the smallest possible number of **straight** lines she drew to make all these shapes?

   (A) 4   (B) 5   (C) 6   (D) 8   (E) 10

5. What is a half plus a quarter plus a fifth?

   (A) 3/11   (B) 16/20   (C) 4/9   (D) 3/20   (E) 19/20

6. In a certain game, nine coloured balls need to be transferred between tubes to match a challenge card (the order of the tubes does not matter). One move consists of transferring the top ball from one tube to another tube. Each tube starts with 3 balls of a single colour, and each tube can hold at most 4 balls. What is the smallest number of moves needed to match the challenge card below?

Challenge Card
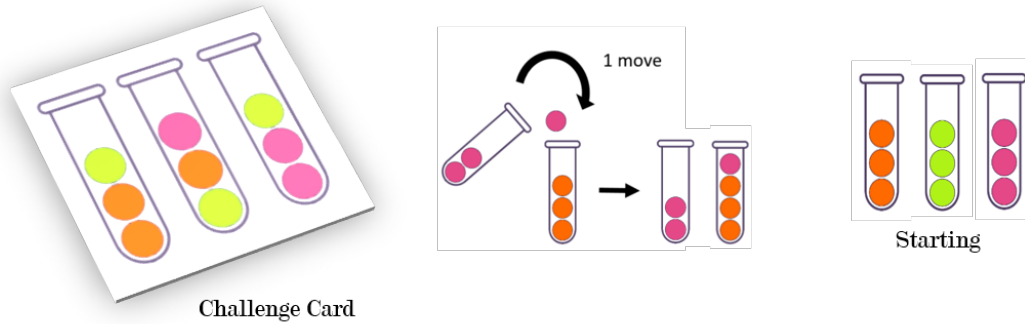
(A) 5   (B) 6   (C) 7   (D) 8   (E) 9

7. Mr. Vlad ran a chess tournament with 6 students. Every player had to play every other player exactly once. How many games were played in total in this tournament?

(A) 12   (B) 15   (C) 25   (D) 30   (E) 36

8. If yesterday was Friday, what day will it be three days from tomorrow?

(A) Sunday   (B) Monday   (C) Tuesday   (D) Wednesday   (E) Thursday

9. Twenty boys want to cross a river in a boat. The boat can carry no more than 5 boys at a time. What is the smallest number of times the boat must cross the river to get all the boys across the river?

(A) 5   (B) 6   (C) 7   (D) 8   (E) 9

Part B (4 points each)

10. Renert Rabbit used 18 matchsticks to make a 1 by 4 and a 2 by 2 rectangle each with area 4 as in the picture below. How many matchsticks will he need to use to create two rectangles both with area 6 but with different perimeters?

(A) 20 　　　　　(B) 22 　　　　　(C) 24 　　　　　(D) 26 　　　　　(E) 28

11. A badminton tournament was run with 26 students, where if a player lost a single game, they are out of the tournament. There were no ties, each game resulted in one of the sides winning, and exactly 2 players played against each other in a game. How many games were played in order for the winner to be determined?

(A) 52 　　　　　(B) 78 　　　　　(C) 280 　　　　　(D) 25 　　　　　(E) 26

12. What is one-half of two-thirds of three-quarters of 300 skittles?

(A) 150 skittles 　　(B) 75 skittles 　　(C) 225 skittles 　　(D) 575 skittles 　　(E) 200 skittles

13. Carrots are planted in a straight line with 30 cm of space between them. Renert Rabbit finds the first carrot and eats it. From there, he jumps to the next carrot and eats every carrot he lands on. If he keeps jumping and eating as he goes, how far would he have jumped when he eats his 20th carrot?

(A) 2.4 m 　　　　　(B) 4.8 m 　　　　　(C) 5.7 m 　　　　　(D) 6 m 　　　　　(E) 6.3 m

14. Jonathan decided to write RENERTRABBITRENERTRABBITRENERTRABBIT... in a repeating pattern. He stops once he reaches the 2022nd letter. How many times would he have written the letter "R"?

(A) 12 　　　　　(B) 168 　　　　　(C) 504 　　　　　(D) 506 　　　　　(E) 674

15. The first three scales show the combined weights of different animals. What is the combined weight of the three different animals?

17 kg   22 kg   21 kg   ?
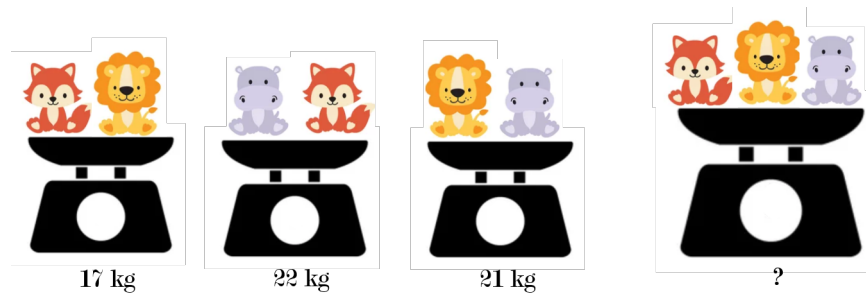
(A) 30 kg   (B) 38 kg   (C) 39 kg   (D) 43 kg   (E) 60 kg

16. Starting with a square and adding two triangles, Renert Rabbit made Shape 1. He added sticks and made Shape 2 that has two squares and four triangles. Adding more, he made 3 squares and 6 triangles for Shape 3. Following the same pattern, how many match sticks will Renert Rabbit use to make Shape 8, that has 8 squares and 16 triangles?
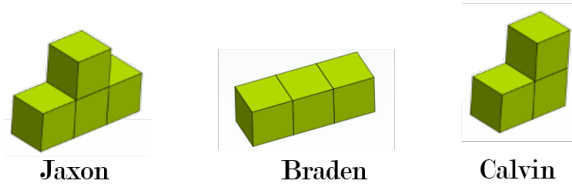

Shape 1   Shape 2   Shape 3
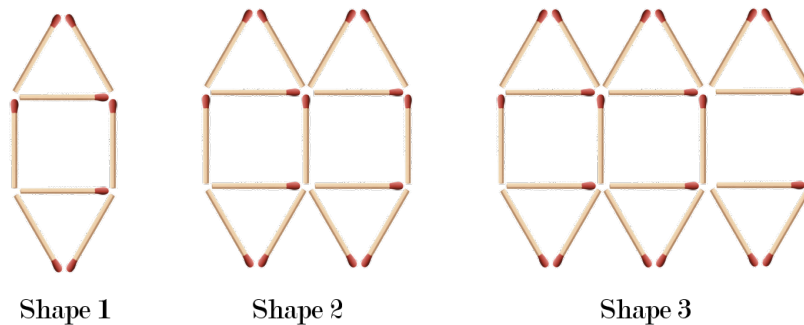
(A) 29   (B) 45   (C) 57   (D) 64   (E) 80

17. What is the smallest number of squares needed to cover a 7×7 square using squares of sizes 1×1, 2×2, 3×3, 4×4, 5×5, or 6×6? No squares may overlap. You may use squares of the same size more than once, but do not need to use every size.
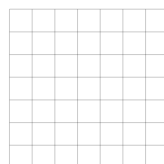
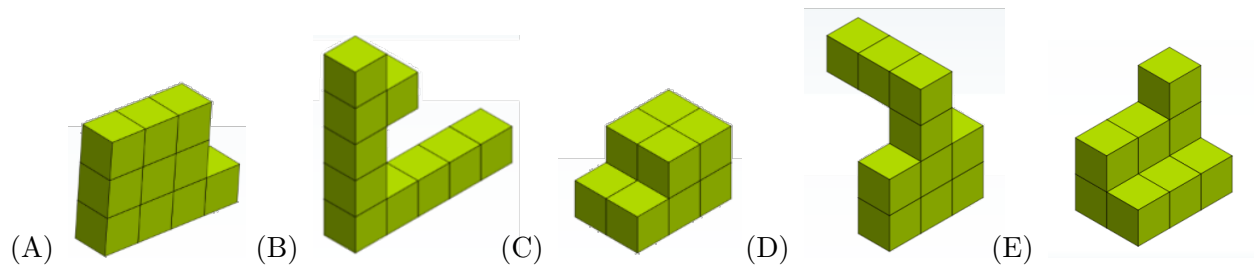(A) 8   (B) 9   (C) 10   (D) 11   (E) 12

18. Jaxon, Braden, and Calvin each created 3D shapes by connecting cubes.

Jaxon   Braden   Calvin

They decided to put their shapes together to create a bigger shape. Below are five different bigger shapes, all using 10 cubes. Which of them CANNOT be made by combining their three pieces?

(A)   (B)   (C)   (D)   (E)

Part C (6 points each)

19. Ms. Marina's birthday is in February, Ms. Doina's is in July and Mr. Vlad's is in December. In March of 2022 they decided to sum up their three birthyears and their three ages. What number did they get?

    (A) 6063   (B) 6064   (C) 6065   (D) 6066   (E) 6067

20. Planet X has two types of creatures. The first type has 8 legs and the second has 5 legs. When Mya visited planet X, she met 39 creatures who had 279 legs altogether. What is the difference between the number of creatures with 8 legs and the number of creatures with 5 legs?

    (A) 3   (B) 17   (C) 19   (D) 21   (E) 240

21. In a bag of marbles, $\frac{1}{3}$ of the marbles are red, $\frac{1}{5}$ are blue, and $\frac{2}{7}$ are green. The rest of the marbles are orange. What is the smallest possible number of orange marbles in the bag?

    (A) 19   (B) 630   (C) 86   (D) 105   (E) 172

22. During a special dinner, 6 rabbits were sitting around a circular table in chairs labelled from A to F.

- Leibniz was sitting to Gauss' immediate right.
- Gauss was not sitting next to Mirzakhani.
- Mirzakhani was sitting in the chair labeled F.
- Gauss was not sitting directly across from Thales.
- Thales was sitting next to Ramanujan.
- Newton was sitting next to Ramanujan.
- Exactly 1 rabbit was sitting between Thales and Leibniz.
- Newton was not sitting to Mirzakhani's immediate left.

In which chair was Gauss sitting?

(A) A   (B) B   (C) C   (D) D   (E) E

23. A password uses the letters in RABBIT exactly once, but in any order. How many different 6-letter passwords are possible if the B's are never next to each other?

(A) 120   (B) 240   (C) 360   (D) 600   (E) 720