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 **50 minutes** to work on the contest.

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

5. Parts A and B of this contest are multiple choice. Each of the questions in these parts is followed by five possible answers marked A, B, C, D, and E. Only one of these is correct. After making your choice, fill in the appropriate circle on the response form.

6. The correct answer to each question in Part C is an integer from 0 to 99, inclusive. Fill in your number using the appropriate circles on the response form. A one-digit answer (such as "4") must be coded with a leading zero ("04").

7. Scoring:

   - Each correct answer is worth:
     - 4 points in Part A,
     - 5 points in Part B,
     - 6 points in Part C.
   - Each unanswered question is worth 2 points.
   - Incorrect answers are worth 0 points.

Part A (4 points each)

1. At which of the following times do the hands of a clock make a right angle?

    (A) 12:00   (B) 6:15   (C) 3:00   (D) 5:35   (E) 10:10

2. Of the following 5 numbers, which is the 2nd largest?

    (A) 2.01   (B) 2.3   (C) 2.09   (D) 2.27   (E) 1.98

3. The temperature in the morning was $-6°$ C. It increased by $8°$ C in the afternoon and then decreased by $11°$ C in the evening. What was the final temperature?

    (A) $-9°$ C   (B) $-3°$ C   (C) $3°$ C   (D) $-5°$ C   (E) $-8°$ C

4. Which option correctly shows the fractions in increasing order?

    (A) $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$ (B) $\frac{1}{4}, \frac{2}{3}, \frac{4}{8}, \frac{11}{12}$ (C) $\frac{1}{6}, \frac{4}{5}, \frac{2}{3}, \frac{9}{10}$ (D) $\frac{4}{5}, \frac{2}{3}, \frac{1}{2}, \frac{7}{8}$ (E) $\frac{1}{7}, \frac{1}{6}, \frac{2}{5}, \frac{3}{7}$

5. The ratio of brown rabbits to white rabbits on a farm is $5 : 3$. If there are 24 white rabbits, how many brown rabbits are there?

    (A) 15   (B) 24   (C) 40   (D) 64   (E) 35

6. $(0.1 \div 0.2 - 0.3) \div 0.4 \div 0.5 =$

    (A) -5 (B) $-5/4$ (C) $1/4$ (D) $5/8$ (E) 1

7. The large triangle is made up of 16 copies of the small triangle. If the small triangle is equilateral and has a perimeter of 24, what is the perimeter of the larger triangle?
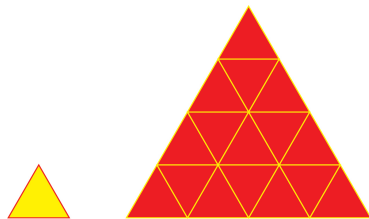
    (A) 48   (B) 72   (C) 96   (D) 128   (E) 384

8. A square and a rectangle have the same area. The side length of the square is 6 cm and the width of the rectangle is 8 cm. What is the length of the rectangle?

    (A) 4 cm   (B) 4.5 cm   (C) 6 cm   (D) 6.5 cm   (E) 8 cm

9. Ayaat, Jaansi, and Keira share a chocolate bar. Ayaat takes $\frac{2}{5}$ of the bar, Jaansi takes $\frac{1}{3}$ of what is left, and Keira takes the remaining 80 grams. What is the weight of the bar in grams?

    (A) 160   (B) 200   (C) 240   (D) 300   (E) 400

Part B (5 points each)
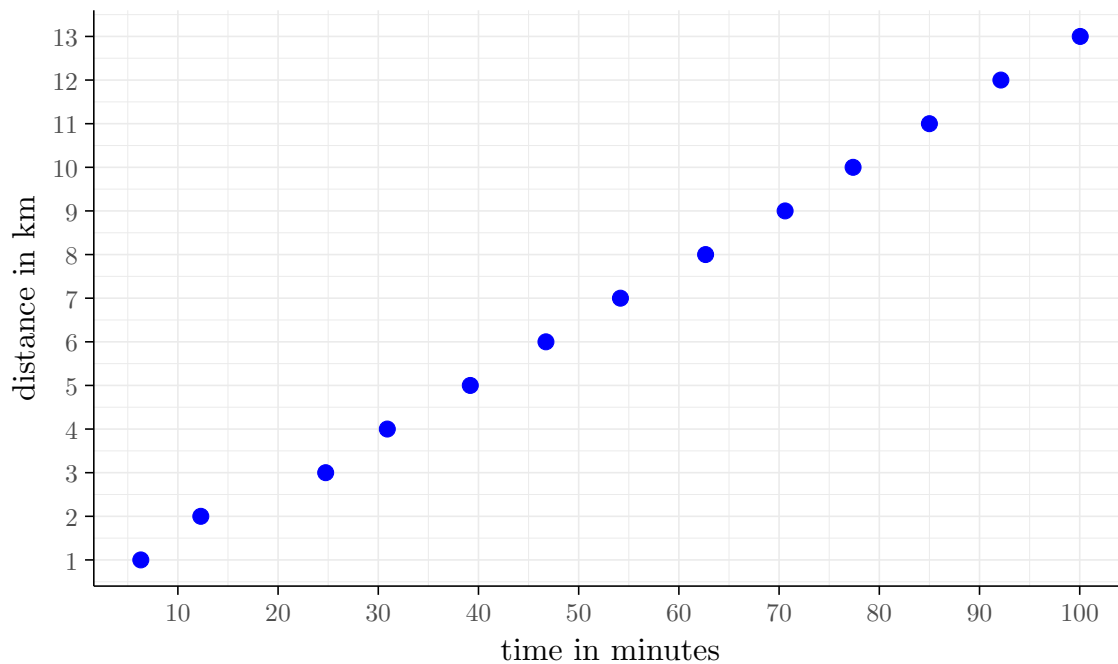
10. How many prime numbers are there between 50 and 80?

    (A) 6   (B) 7   (C) 8   (D) 9   (E) 10

11. The sum of five consecutive numbers is 70. What is the sum of the next five consecutive numbers?

    (A) 12   (B) 75   (C) 95   (D) 110   (E) 128

12. Aaron Renert loves trail running in Kananaskis. The scatter plot below shows his distance and time over the first 13 km of his most recent run.


    Which of the following is the closest to his average speed over the first 3 km?

    (A) 7.2 km/hr   (B) 13 km/hr   (C) 7.8 km/hr   (D) 8.3 km/hr   (E) 6 km/hr

13. Alex, who is 10 years old asked me: "How old are you?" I answered: "I will be 46 years old when you reach the age I am now." How old am I?

    (A) 56   (B) 36   (C) 38   (D) 28   (E) 46

14. Olivia starts with the point $(4, 3)$ on the Cartesian plane. She then translates the point 2 units to the right, followed by a reflection across the line $y = 1$. What is the point she ends up with?
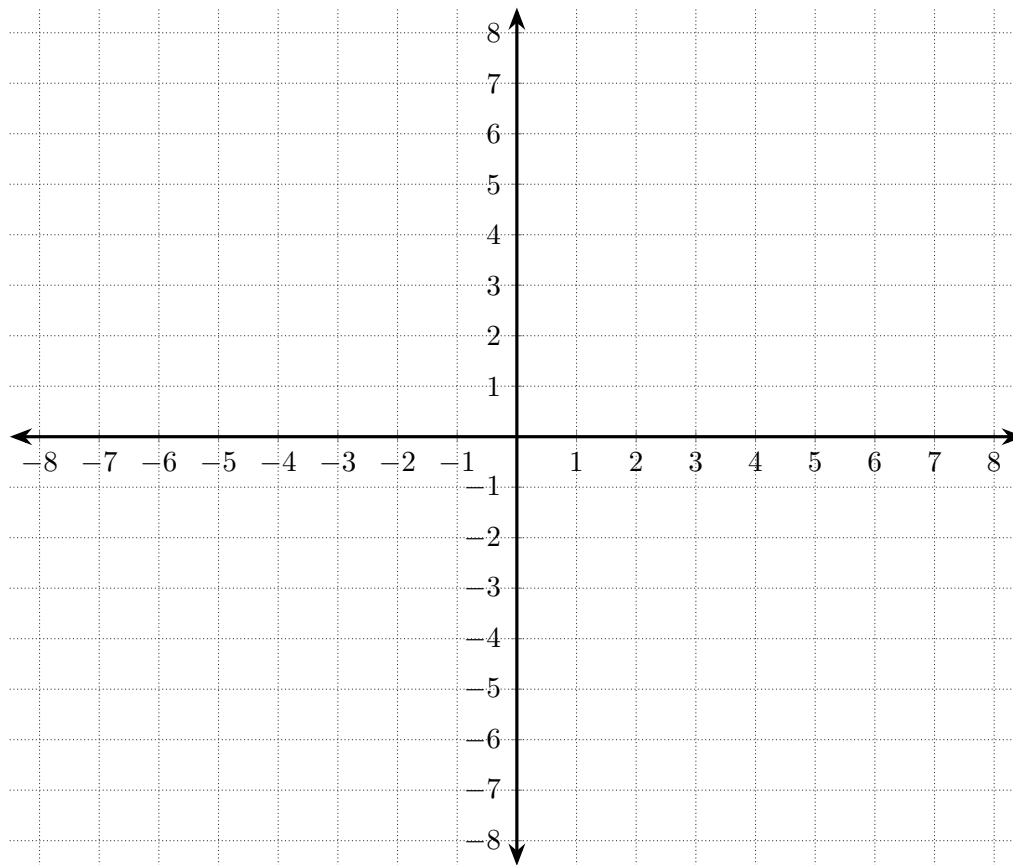
   (A) $(-4, 5)$ (B) $(-2, 5)$ (C) $(6, -1)$ (D) $(6, -3)$ (E) $(-6, 3)$

15. In a basketball drill, Xander shoots 100 times. After 7 such drills, his average score is 86 baskets. If he made all 100 baskets in exactly two of the drills, then what is the fewest number of shots he could have made in one of the drills?

    (A) 6   (B) 2   (C) 0   (D) 1   (E) 4

16. Aarya and Stephenie had some money. If Stephenie gave Aarya $30, they would have the same amount of money. If Aarya gave Stephanie $30, Stephanie would have 7 times the amount of money that Aarya would have. How much money does Aarya actually have?

(A) 35   (B) 45   (C) 50   (D) 55   (E) 60

17. Renert Rabbit makes 8 identical cubes using 8 copies of the net below. He then glues them together to make a larger $2 \times 2 \times 2$ cube. What is the largest number that he can get when he adds all the numbers from all 6 faces of the larger cube?

		1	
-2	0	-1	0
		2	
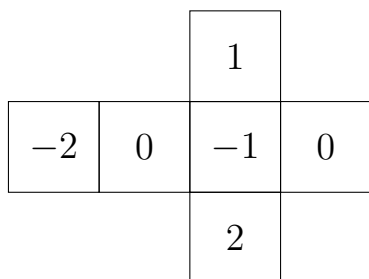
(A) 6   (B) 12   (C) 0   (D) 8   (E) -1

18. Jack found 16 matchsticks and decided to use them all to make a triangle without breaking any matchsticks. How many different triangles can be made with 16 matchsticks assuming that one side is 4 matchsticks long?

(A) 1   (B) 2   (C) 3   (D) 4   (E) 5

Part C (6 points each)

19. A gazelle is running at 97 km/h and a cheetah is chasing it at 115 km/h. If the distance between them is 30 meters, how many seconds will it take the cheetah to catch up to the gazelle?

20. In a group of people, 30% are reading fantasy books, 20% are reading adventure books, 16% are reading comic books, 10% are reading horror books, and the remaining 84 people are reading science fiction books. If a third of the people reading fantasy books switch to reading horror books and two people switch from reading horror books to reading adventure books, how many people are then reading horror books?

21. Leland has triangular tiles with side lengths 3, 4, and 5. What is the fewest number of tiles he needs to make a square with no gaps, if the tiles cannot overlap or be broken?

22. A number is palindromic if it can be read the same forwards and backwards. For example, 575 is palindromic, but 577 is not. How many 5-digit palindromic numbers are divisible by 36?

23. In a 3×4 lily pad grid, a frog starts in the bottom left and wants to get to the top right. In how many ways can the frog do this if it may jump 1 or 2 pads right or 1 or 2 pads up?