Mathcounts / AMC 8 Beginner
Homework 4

Name _____

1. Consecutive numbers are counting numbers that follow in order as in 7, 8, 9, 10, and so forth. Suppose the average of 15 consecutive numbers is 25. What is the average of the first five numbers of the set?

2. What is the sum of the following sequence?

   $51 + 53 + 55 + \ldots\ldots\ldots\ldots + 597 + 599$

3. 1^2 means 1 x 1, 2^2 means 2 x 2, 3^2 means 3 x 3, and so forth.

   $1^2 + 2^2 + 3^2 + 4^2 + \ldots\ldots\ldots + 25^2 = 5525$, and
   $2^2 + 4^2 + 6^2 + 8^2 + \ldots\ldots\ldots + 50^2 = N$

   Find the value of N.

4. The counting numbers are arranged in four columns as shown at the right. Under which column letter will 1782 appear?

A	B	C	D
1	2	3	4
8	7	6	5
9	10	11	12
...	...	14	13

5. Lena and Jade had a total of $36. Lena had twice as much money as Jade. After each of them bought a movie ticket, Lena had 3 times as much money as Jade. How much was a movie ticket?

6. One loaf of bread and six rolls cost $1.80. At the same prices, two loaves of bread and four rolls cost $2.40. How much does one loaf of bread cost?

7. Mrs. Jones went to a store, spent 2/3 of her money and then $20 more. She went to a second store, spent half of her remaining money and then $15 more. But she then had no money left. How much money did she have to begin with when she went to the first store?

8. I spent 3/8 of my money in store A. I then spent 3/4 of what remained in store B. When I left store B, I had $5. how much money did I have when I entered store A?

9. If we count by 7s starting with 3, the following sequence is obtained. 3, 10, 17, 24, ... What is the 50^{th} number in the sequence?

10. The numbers 2, 4, 6, and 8 are a set of four consecutive even numbers. Suppose the sum of seven consecutive even numbers is 350. What is the smallest of the seven numbers?

11. Ann gave Betty as many cents as Betty had. Betty then gave Ann as many cents as Ann then had. At this point, each has 12 cents. How much did Ann have at the beginning?

12. The weight of a whole brick is the same as 4 pounds plus the weight of 1/3 of the whole brick. How many pounds does the whole brick weigh?

13. Alice started a Math Club during the first week of school. As the only member, she decided to recruit two new members during the following week of school. Each new member, during the week following the week when he or she became a member, recruits two new members. How many members will the club have at the end of five weeks?

14. Alice and Betty run a 50-meter race and Alice wins by 10 meters. They then run a 60-meter race, and each girl runs at the same speed she ran in the first race. By how many meters will Alice win?

15. One day, Carol bought apples at 3 for 25 cents and sold all of them at 2 for 25 cents. If she made a profit of $1 that day, how many apples did she sell?

Warm-Up 3

16 1. _____ Thirty percent of twice a number is 30. What was the original number?

17 2. _____ inches A bouncy ball bounces 16 feet high on its first bounce and exactly half as high on the next bounce. For each later bounce, the ball bounces half as high as on the previous bounce. How many inches high does the ball bounce on its seventh bounce?

18 3. $ _____ Tamika's dad bought a Mustang convertible for $12,000 to celebrate his first job in 1978, which paid him $15,000 a year. If Tamika is to use the same fraction of her salary as her dad to buy a Mustang convertible, which now sells for $32,000, what will her first job have to pay?

19 4. _____ A rectangular prism has dimensions 4 by 6 by x. If the total surface area of the prism is 248 square units, what is the value of x?

20 5. _____ ways How many ways can the letters in FACTOR be rearranged so that the first and last letters are vowels?

21 6. _____ If $a \# b = (a + b)^2$, what is the value of $3 \# 1$?

22 7. _____ The triangular array of positive integers shown continues indefinitely, with each row containing one entry more than the row above it. What is the sum of the two integers directly above 100?

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4
7   10
13  16  19
22  25  28  31
34  37  40  43  46
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23 8. _____ points In a class of 20 students, the average (arithmetic mean) score on a test is 84 points. If 6 students each scored 100 points and 4 students each scored 50 points, what is the average of the scores of the remaining students?

24 9. _____ If $\frac{a-2b}{3a-4b} = 5$, what is the ratio of a to b? Express your answer as a common fraction.

10 10. (,) _____ If triangle WIN is reflected over the x-axis to create triangle W'I'N', what will be the coordinates of point I'? Express your answer as an ordered pair.