WINMAC

2019
Dash Round

Name: ______________________ Score: __________ / 45

PLEASE DO NOT FILL IN ABOVE! (the “SCORE” blank)

Grade: ______________ Team: ______________

This is a round consisting of 15 problems to be done in 25 minutes. Problems are in roughly ascending difficulty. Each question will be worth 3 points. Any figures or diagrams in the test may not be to scale.

No aids are permitted aside from pencils, pens, and provided scratch paper. In particular, no calculators or other computers are permitted. Communication with other people will result in a zero.

Record your answers in the box corresponding to the correct problem. Only answers printed in the boxes below will be scored.

Your Answers

1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

1. What is the value of $5 - 15 + 25 - 35 + 45 - 55 + 65 - 75$?

2. A track and field competition has a total of 15 events. If ten athletes competed in each event and each athlete competed in three events, how many participants were there in total?

3. Find the sum of the digits of

$$1 + 11 + 111 + 1111 + \cdots + \underbrace{11\ldots11}_{\text{9 digits}}$$

.

4. How many digits (counting numbers from both sides of the decimal point) are in $\frac{111111}{40}$ when the fraction is converted to a decimal?

5. A cow lives in a fenced off pasture. Each day, the cow eats $\frac{1}{3}$ of the grassy areas, and at night, $\frac{1}{2}$ of the eaten areas grow back. What fraction of the pasture will have grass after 3 days and 3 nights?

6. Cam plays 105 games of chess against Alex. If Cam is able to keep a 102-3 win-loss record, what is the minimum possible value of the longest win streak he had against Alex?

7. What is the maximum number of intersection points possible between a quadrilateral and a line? Note: the line does not overlap any side of the quadrilateral.

8. a is 20% of b. b is 19 times c. What percent of $5c$ is a?

9. Let N be the smallest integer with no repeated digits and a digit sum of 19. Find the largest prime factor of N.

10. How many ways are there to color the four sides of square $ABCD$ red, blue, and green in such a way that no two adjacent sides have the same color? Note that rotations and reflections are considered distinct.

11. Robert has four consecutive even integers. Sam also has four consecutive even integers. If the product of Robert's numbers is twice the product of Sam's numbers, find the sum of Robert's numbers.

12. A drawer has 2 blue socks and 4 red socks. Another drawer has 6 blue socks and 8 red socks. If you take out a sock from each drawer, what is the probability that you will get a matching pair?

13. The integers from 1 to 9 are written on a whiteboard. In how many ways can Robert erase some (but not all) of the integers such that the remaining numbers on the board have an odd product?

14. On a 6×8 origami paper with corners A, B, C, and D, $AB = CD = 6$ and $AD = BC = 8$. Kevin cuts straight on diagonal $\overline{AC}$ to make $\triangle ABC$ and $\triangle ACD$. He takes $\triangle ABC$ and draws point E on $\overline{BC}$ so that if he folds $\overline{AB}$ onto $\overline{AC}$, the resulting figure is $\triangle ACE$. What is the area of $\triangle ACE$?

15. Buckets A, B, and C each start out with an equal amount of water. A pipe transfers water from bucket A to bucket B at a rate of x gallons per second. A second pipe transfers water from bucket B to bucket C at $2x$ gallons per second. A third pipe transfers water from bucket C to bucket A at 5 gallons per second. When bucket B becomes the first empty bucket, bucket A has three times as much water as bucket C. Find x.