WinMaC 2018

Name: _____ Score: _____ / 45

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. Evaluate: $28 + 46 + 64 + 82$.

2. A barn was filled with chickens, ducks, and geese. There were more chickens than ducks and more ducks than geese. If there were a total of 20 animals, at least how many were chickens?

3. If 58% of a number is 3, what is 87 times this number?

4. Huang's hardware store buys used hard drives at 20 for \$180 and sells each for \$18. How many drives does Huang need to purchase in order to earn a profit of \$2018?

5. Last year, WinMaC was held on 6/10/17. That date is special because the month number and the day number sum to one less than the last two digits of the year. How many dates satisfy this property this year? (π day, 3/14/18, was one such day.)

6. Robert and Jason work on an essay which is 2000 words long. Robert can type 25 words per minute. It takes Jason 40 minutes to complete the entire essay by himself. Jason joins Robert after Robert has worked for 11 minutes. How many more minutes will they need to work to complete the essay?

7. If the sum of the digits of a positive integer n is 150, then what is the maximum possible value of the sum of the digits of $n + 2018$?

8. If a, b, and c are natural numbers such that a is divisible by 72, b is divisible by 54, and c is divisible by 90, then what is the largest natural number that $a + b + c$ must be divisible by?

9. Jeff picks 5 random integers between 1 and 7 and finds their product. How many different numbers can Jeff get?

10. Today is Michael's birthday. The middle two digits of his birth year represent his current age. Given that he was born before 2000, in what year was he born?

11. Regular hexagon $WINMAC$ has side length 2018. Segments CW and NI are extended past W and I to meet at a point P. What is the perimeter of triangle WPI?

12. Find the sum of all intergers from 1 to 40 that have exactly 6 factors.

13. Robert develops a new mobile app called balls 'n' sticks where the objective of the game is using sticks to connect each red ball with 5 other balls and each blue ball with 7 other balls. On level 2018, there are 20 red balls and 18 blue balls. Without drawing a model, find the number of sticks needed to complete this objective.

14. At McCall Middle School, Will's first class starts at noon. He notices that each of his classes starts when the hour hand is exactly over the minute hand. If each of his classes are between 1 and 2 hours long, and he has a 5 minute break in between each of his classes, how long are each of Will's classes in minutes?

15. P is a point in $\triangle ABC$. D and E are on $\overline{BP}$ and $\overline{CP}$ respectively such that $AD = AE = DE$. If $m\angle ADB = 135°$ and $m\angle AEC = 160°$, find $m\angle BPC$.