Spring 2017 McNabb GDCTM Contest
Pre-Algebra

NO Calculators Allowed

1. Hezy paid \$19.04 for a shirt that was marked 15% off. What was the original price of the shirt?

2. Which is larger: 7^{14} or 14^7?

3. What is the positive difference between the sum of the first two-hundred positive multiples of four and the first one-hundred positive multiples of eight?

4. Find the smallest positive integer n so that $28n$ is a perfect square.

5. Find the units digit of 17^{2017}.

6. Let $x = 0.\overline{57}$ and $y = 0.\overline{03}$. Write $x + y$ in simplified fraction form.

7. Find the positive integer n so that $n/17$ gives the best possible approximation to $\sqrt{2}$.

8. Find the sum of the eight largest four digit pallindromes.

9. What is the remainder when 123456654321 is divided by seven?

10. A basketball league has two divisions of nine teams each. In a season, each team plays every other team in their division twice, and every team in the other division once. How many games are played in total in one season?

11. Find the 2017th decimal place in the decimal expansion of the fraction $1/37$.

12. In how many ways can two subsets of
$$S = \{a, b, c, d, e, f\}$$
be chosen so that their union is S and their intersection contains three letters? The order of the subsets is not material.

13. Simplify $\sqrt[3]{970299}$.

14. Let a, b, c, and d, be four distinct integers whose product is 1024. Find the least possible value of their sum.

15. In how many ways can $1,000,000$ be written as the product of three positive integers, where the order of the factors matters?