11. When Sumana's piggy bank broke, she discovered that the number of 5 rupee coins she had was three times the number of 10 rupee coins she had and that the value of the 2 rupee coins she had was three rupees more than the value of the 5 rupee coins she had. If Sumana had at least ten 2 rupee coins, what is the minimum amount that she must have had?

(A) 112 Rupees (B) 115 Rupees (C) 120 Rupees (D) 123 Rupees (E) 128 Rupees

12. Pasindu says that his six digits secret number is the smallest positive integer such that it is a multiple of 9 and if its first and last digits are crossed out then the remaining number has only 11 as a prime factor. What is Pasindu's secret number?

(A) 111114 (B) 122220 (C) 333333 (D) 113310 (E) 113319

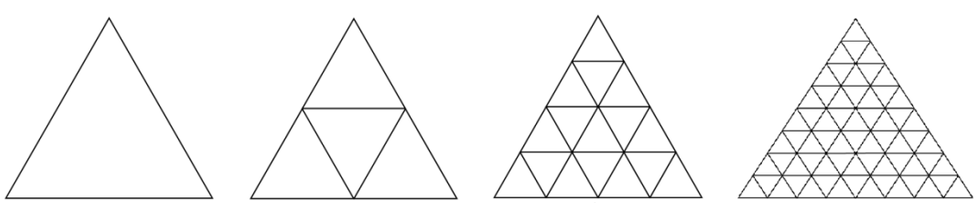
13. There are four keys and four locks. Each of the four keys fits exactly one of the four locks and different keys fit different locks. In the worst-case scenario what is the minimum total number of times a key has to be tested in a lock to match up all the keys and locks?

(A) 2 (B) 4 (C) 5 (D) 6 (E) 8

14. Champernowne constant in base 10 is 0.123456789101112… . This is the number obtained by concatenating the positive integers and interpreting the digits as decimal digits to the right of the decimal point. What is the 2018th digit to the right of the decimal point?

(A) 0 (B) 2 (C) 3 (D) 6 (E) 7

15.



The first four figures in a pattern are given above. The first figure in the pattern is an equilateral triangle. Each other figure in the pattern is obtained by joining the midpoints of the sides of the triangle/triangles in the previous figure with straight lines parallel to the sides. If the number of triangles of the smallest size in two successive figures add up to 20 480, which two figures in this pattern are they? (Note: $4^6 = 4096$)

(A) 4th and 5th (B) 5th and 6th (C) 6th and 7th (D) 7th and 8th (E) 8th and 9th

16. How many parallelograms are contained in the 4th figure in the pattern given in question 15 above? (Hint: symmetry)

(A) 620 (B) 625 (C) 630 (D) 635 (E) 640

17. If $\frac{1}{3}+\frac{1}{3}+\ldots+\frac{1}{3}=\frac{1}{5}+\frac{1}{5}+\ldots+\frac{1}{5}$ and the total number of fractions on both sides is between 20 and 26 then what exactly is the total number of fractions?

(A) 21 (B) 22 (C) 23 (D) 24 (E) 25

18. Let $a_1, a_2, a_3, \ldots, a_{2017}, a_{2018}$ be a sequence of real numbers such that $a_1 = 1$ and $a_{n+1} + a_n = a_{n+1}^2 - a_n^2$ for $n \geq 1$. What is the minimum possible value of a_{2018}?

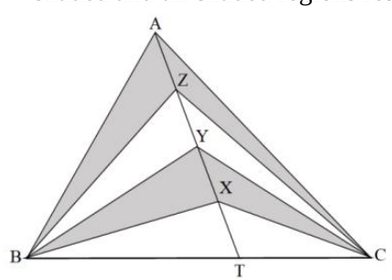
(A) -2018 (B) -2017 (C) 0 (D) 2017 (E) 2018

19. A rectangular chocolate bar of size $x \times y$ where x and y are positive integers consists of xy small squares. The bottom left square is bitter and the other squares are sweet. Two players take turns in selecting a square and eating all the squares above and to the right of the selected square in a rectangular block including the selected square. The player who has to eat the bitter square loses. Which of the following is/are true?

I. If $x \neq 1$ and $y \neq 1$ then the first player, the player who eats first, has a winning strategy.
II. If $x \neq 1$ and $y \neq 1$ then the second player has a winning strategy.
III. If ($x = 1$ and $y \neq 1$) or ($x \neq 1$ and $y = 1$) then the first player can win in a single move.

(A) I only (B) II only (C) I and III only (D) None (E) All

20. Consider the figure given below. T is a variable point on the side BC of triangle ABC. Points X, Y, Z are on AT such that $AZ = ZY = YX = XT$. Let S and U be the areas of the shaded and un-shaded regions respectively. Which of the following statements is/are true?



I. $S = U$ only when AT is perpendicular to BC.
II. $S = U$ only when T is the midpoint of BC.
III. $S = U$ for any position of T on the line segment BC.

(A) I only (B) II only (C) III only (D) None (E) All