Bergen County Math League

Good Luck to You  **Good Luck to All**

Contest #1 **2021-2022** **12 minutes** **Questions 1 & 2**

1-1. My street address is a 3-digit number. If the product of the digits is 140, and the digits appear in increasing order from left to right, what is my street address?

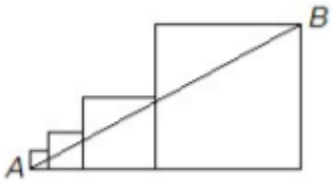
1-2. There is only one positive number *a* for which $x^2 + ax + 2027 = 0$ has two integral roots. What is the value of *a* ?

Bergen County Math League

Good Luck to You | **Good Luck to All**

Contest #1 | **2021-2022** | **12 minutes** | **Questions 3 & 4**

1-3. Four squares are lined up horizontally, as shown. The length of a side of the first square is 1. Each square after that has a side that is twice as long as a side of the previous square. What is the value of *AB* ?



1-4. How many ordered pairs of positive integers (*a,c*) satisfy the equation $a^3 + 64 = c^3$?

Bergen County Math League

Good Luck to You  **Good Luck to All**

Contest #1 **2021-2022** **12 minutes** **Questions 5 & 6**

1-5. The lengths of the sides of a right triangle are in the ratio 3:4:5. If the length of one of the three altitudes of this triangle is 60, what is the greatest possible area of this triangle?

1-6. The set {1, 2, 3} has $8 = 2^3$ different subsets: {1, 2, 3}, {1, 2}, {1, 3}, {2, 3}, {1}, {2}, {3}, and { }. The set {1, 2, 3, 4, 5, 6, 7, 8} has $256 = 2^8$ different subsets. If Lee sums the elements in each subset of {1, 2, 3, 4, 5, 6, 7, 8}, and then adds these 256 sums together, what total should Lee get?