Bergen County Math League

Calculators Permitted

Good Luck to You

BCML

Good Luck to All

Contest #5   2022-2023   12 minutes   Questions 1 & 2

5-1.   What is the least value of y such that $|4 + x| + |5 + y| \leq 100$ for some value of x?

5-2.   What is the maximum area of a triangle, the lengths of whose sides are a, b, and c, subject to the following restrictions?

$$\begin{cases} 0 \leq a \leq 1 \\ 1 \leq b \leq 2 \\ 2 \leq c \leq 3 \end{cases}$$

Bergen County Math League

Calculators Permitted

Good Luck to You

BCML

Good Luck to All

Contest #5   2022-2023   12 minutes   Questions 3 & 4

5-3.   A triangle is bordered by three squares. If the areas of the squares are 225, 196 and 169, what is the area of the triangle?

5-4.   A 3 by 3 additive magic square is constructed using the integers 5, 6, 7, 8, 9, 10, 11, 12, and 13, each integer used exactly once. The sum of the numbers in each row, column and major diagonal must all be the same. What will be the sum of the integers in the top row?

Bergen County Math League

Calculators Permitted

Good Luck to You

BCML

Good Luck to All

Contest #5   2022-2023   12 minutes   Questions 5 & 6

5-5.   Two circles intersect in two points, at most. Three circles intersect in six points, at most. In how many distinct points do five circles intersect, at most?

5-6.   Two candles have the same length. The fat candle burns down uniformly in f hours, while the thin candle burns down uniformly in t hours. Both candles are lit simultaneously; and, one hour later, the fat candle (for the first time) is twice the length of the thin candle. Write an EQUATION expressing t explicitly in terms of f.