

INTEGIRLS Houston: 2022 Fall Math Contest

Middle School Relay Round 1

1. How many numbers from 1 to 50 inclusive are divisible by three or five?
2. Let $T = TNYWR$ (The Number You Will Receive). Chloe shapes a piece of yarn into a regular polygon with $T + 1$ sides of length 6 in.. If she uses the whole length of yarn to create a square, what is the area of it in in.²?
3. Let $T = TNYWR$ (The Number You Will Receive). A computer named Ell draws $(T \bmod 22)$ concentric circles around point O , where the radius of the smallest circle is one unit and the radius of each subsequent circle is three units more than the circle drawn closest to it. If A is a point on the outermost circle and B is a point on the $(T \bmod 34)$ circle such that $\angle ABO = 90^\circ$, what is the length of the median from B ?
4. Let $T = TNYWR$ (The Number You Will Receive). After winning the science fair, Ellen and Kemi receive $\frac{T+1}{6}$ packs of multicolored erasers as a reward. Each pack has one red, orange, yellow, green, blue, indigo, and violet eraser (all the colors of the rainbow), in that order from left to right. They take the erasers out of their packs and arrange them in a line in the same order (i.e. starts at the left with red, orange, ..., violet, and then repeats again with the next pack). They decide to split the erasers among themselves and give the remaining ones to their science teacher. If Ellen takes every third eraser, and Kemi takes every fourth eraser after Ellen is done choosing, how many indigo erasers will their science teacher get?