

Physics Cup 2017 - Problem 2 (contributed by Ivan Erofeev) without hints. 16th April 2017

There are n points forming n -gon. Adjacent points (sides of n -gon) are connected with resistance $R_s = 2\Omega$, all other pairs (diagonals) are connected with resistance $R_s = 1\Omega$. Find the full resistance between two adjacent points. Using your expression, calculate answer (as a rational number in ohms) for $n = 3$, $n = 4$, and $n = 5$. Feel free to use mathematics software to ease algebraic calculations, if needed (such as Wolfram Alpha).