

Intermediate Test 4

Stellenbosch Camp 2018

Time: $2\frac{1}{2}$ hours

1. How many numbers from 1 to 2018 inclusive can be written as the difference of two perfect squares?
- 2.
- 3.
- 4.
5. Let A_1, A_2, A_3 be three points in the plane, and for convenience, let $A_4 = A_1$, $A_5 = A_2$. For $n = 1, 2$ and 3 , suppose that B_n is the midpoint of $A_n A_{n+1}$ and suppose that C_n is the midpoint of $A_n B_n$. Suppose that $A_n C_{n+1}$ and $B_n A_{n+2}$ meet at D_n and that $A_n B_{n+1}$ and $C_n A_{n+2}$ meet at E_n . Calculate the ratio of the area of triangle $\triangle D_1 D_2 D_3$ to the area of triangle $\triangle E_1 E_2 E_3$.

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