

(1) Give the following numerical values.

$$(a) \sum_{k=1}^8 C_k^8 \quad (b) \sum_{k=1}^{50} (5k-3) \quad (c) \sum_{k=0}^{79} \left(\frac{1}{4}\right)^i \quad (d) \sum_{k=8}^{99} \left(\frac{3}{2}\right)^i \quad (e) \sum_{k=4}^{800} (3k-5)$$

(2) What does $\frac{2}{25} + \frac{2}{125} + \frac{2}{625} + \frac{2}{3125} + \frac{2}{15625} + \frac{2}{78125} + \frac{2}{390625} + \frac{2}{1953125}$

(3) Write 0.333333..... as a ratio using natural numbers.

(4) Write 0.123123123... as a ratio using natural numbers.

(5) You flip 5 (ordered) coins and write down the sequence of heads and tails. For example H,T,T,T,H. How many sequences are possible? How many sequences have two H? Write them all down. How many sequences have three T? Write them all down.

(6) You have an equilateral triangle each of whose sides has length 1. You trisect each side and put an equilateral triangle using the middle piece as the base. What is the perimeter of this new shape? You do this again. What is the perimeter of this shape? You do this again. What is the perimeter of this shape?