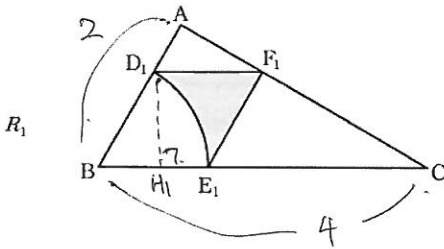
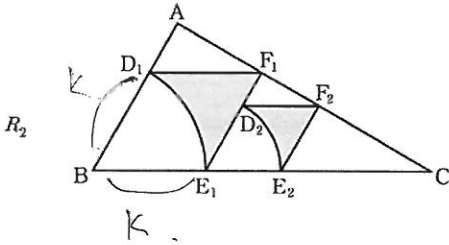


* 2019년 10월 시행 교육청 고3 수학 나형 19번.



$$\overline{BD_1} = \overline{BE_1} = k \text{라 하면}$$

$$\overline{DH_1} = \overline{BD_1} \times \sin(\angle ABC) = k \times \frac{\sqrt{3}}{2}$$



$$1) n: 1 \rightarrow 1. \quad \therefore n \geq 1.$$

$$2) \overline{AB} : \overline{BC} = \overline{E_1F_1} : \overline{E_1C} = 2 : 4 = k : 4 - k.$$

$$\therefore k = \frac{8}{6} = \frac{4}{3}$$

$$l_r: \overline{AB} \rightarrow \overline{E_1F_1} (=k). \quad \therefore l_r = \frac{\frac{4}{3}}{\frac{2}{1}} = \frac{2}{3}, \quad S_r = \frac{4}{9}$$

$$3) \square BE_1F_1D_1 (\text{마름모}) - \triangle BE_1D_1 (\text{부채꼴}) = a.$$

$$\therefore k \times (k \times \frac{\sqrt{3}}{2}) - \frac{1}{2} \times k^2 \times \frac{\pi}{3} = \frac{8\sqrt{3}}{9} - \frac{8\pi}{27}$$

$$\text{따라서 } \lim_{n \rightarrow \infty} S_n = \frac{\frac{8\sqrt{3}}{9} - \frac{8\pi}{27}}{1 - \frac{4}{9} \times 1} = \frac{\frac{24\sqrt{3} - 8\pi}{27}}{\frac{5}{9}} = \frac{24\sqrt{3} - 8\pi}{15} //$$

$$= \frac{8(3\sqrt{3} - \pi)}{15}$$