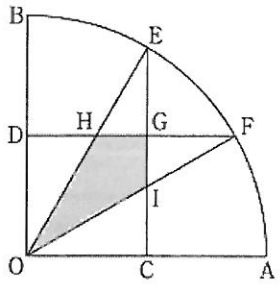
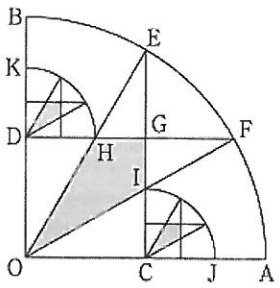
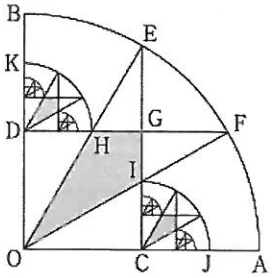
* 2020학년도 6월가천 9월 수학 나형 18번.



R_1



R_2



R_3 ...

...

① n ; $1 \to 2$. $\therefore n=2$.

② $\overline{OA}=\overline{OB}=\overline{OE}=\overline{OF}=2$, $\overline{OD}=\overline{OC}=\overline{CG}=\overline{DG}=1$.

직선 OE를 $y=\sqrt{3}x$로 놓으면 점H와 점I는 다음과 같다. $H\left(\frac{1}{\sqrt{3}}, 1\right)$, $I\left(1, \frac{1}{\sqrt{3}}\right)$.

$\therefore \overline{DH}=\overline{CG}-\overline{HG}=\frac{1}{\sqrt{3}}$. $\therefore \overline{HG}=1-\frac{1}{\sqrt{3}}$.

l_r : $2 \to \frac{1}{\sqrt{3}}$. $\therefore l_r=\frac{1}{2\sqrt{3}}$, $S_r=\frac{1}{12}$.

③ $\square OIGH$

$=\triangle OCE-\triangle HGE-\triangle OCI$

$=\frac{1}{2}\times 1\times\sqrt{3}-\frac{1}{2}\times\left(1-\frac{1}{\sqrt{3}}\right)\times(\sqrt{3}-1)-\frac{1}{2}\times 1\times\frac{1}{\sqrt{3}}$

$=\frac{\sqrt{3}}{2}-\frac{4-2\sqrt{3}}{2\sqrt{3}}-\frac{1}{2\sqrt{3}}=\frac{3-4+2\sqrt{3}-1}{2\sqrt{3}}=\frac{-2+2\sqrt{3}}{2\sqrt{3}}=\frac{-1+\sqrt{3}}{\sqrt{3}}$.

$\therefore \lim_{n\to\infty} S_n=\frac{\frac{-1+\sqrt{3}}{\sqrt{3}}}{1-\frac{1}{12}\times 2}=\frac{-6+6\sqrt{3}}{5\sqrt{3}}=\frac{18-6\sqrt{3}}{15}=\frac{6-2\sqrt{3}}{5}$ //