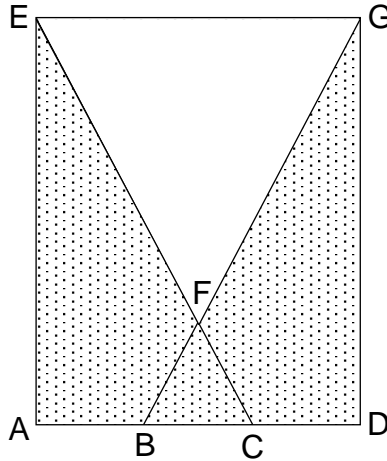


A Maths Question, PSLE 2023

In the figure, ADGE is a rectangle where $AB = BC = CD$. CE intersects BG at F. Given that the area ratio of $\triangle AEC$ to $\triangle FBC = 8 : 1$, what fraction of rectangle ADGE is shaded?

<< Area of triangle >>



<Writing>

Diagonal DE divides the area of rectangle ADGE into two equally.

$$1 \div 2 = \frac{1}{2}$$

$\triangle AEC$ and $\triangle ADE$ have an equal height AE, and $AB = BC = CD$.

Therefore, the area of $\triangle AEC$ is $\frac{2}{3}$ of the area of $\triangle ADE$.

$$\frac{1}{2} \times \frac{2}{3} = \frac{1}{3} \quad \rightarrow \text{The area of } \triangle AEC \text{ is } \frac{1}{3} \text{ of the area of rectangle ADGE.}$$

Since $\triangle FBC$ is $\frac{1}{8}$ of $\triangle AEC$ in area,

$$\frac{1}{3} \times \frac{1}{8} = \frac{1}{24} \quad \rightarrow \text{The area of } \triangle FBC \text{ is } \frac{1}{24} \text{ of the area of rectangle ADGE.}$$

$\triangle AEC$ and $\triangle DGB$ are in the same area.

They are overlapping at $\triangle FBC$. Hence

$$\frac{1}{3} + \frac{1}{3} - \frac{1}{24} = \frac{5}{8} \quad \rightarrow \text{shaded region}$$

Answer $\frac{5}{8}$