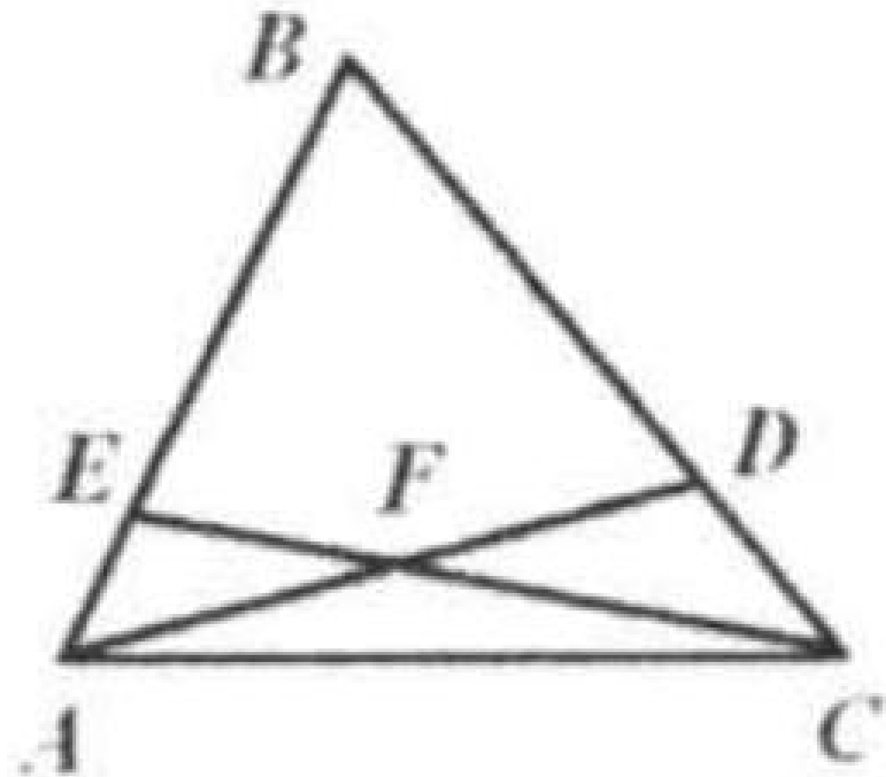
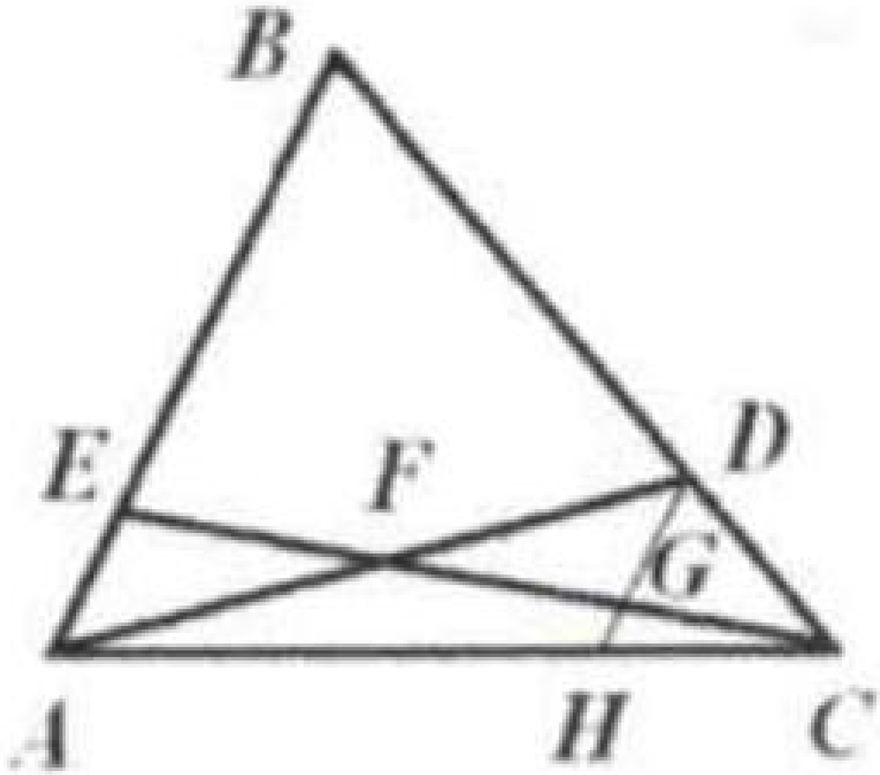
Problem

(AMC) Point E is selected on side AB of triangle ABC in such a way that $AE : EB = 1 : 3$ and point D is selected on side BC so that $CD : DB = 1 : 2$. The point of intersection of AD and CE is F. Then $\frac{EF}{FC} + \frac{AF}{FD}$ is (A) $\frac{4}{5}$
(B) $\frac{5}{4}$
(C) $\frac{3}{2}$
(D) 2
(E) $\frac{5}{2}$



Solution

(C).
Draw $DH//AB$. $\therefore DG : 3a = b : 3b; DG = a = EA. \therefore EF = FG$ and $AF = GD$, so that $AF/FD = 1$. Also $DH : 4a = b : 3b, DH = 4a/3$ and $GH = DH - DG = a/3; \therefore GC = \frac{1}{3}EC$ and $EG = \frac{2}{3}EC$ and , since $EF = FG, FC = \frac{2}{3}EC. \therefore$



$$EF/FC = \tfrac{1}{2}.$$

$$\therefore \quad (EF/FC) + (AF/FD) = \tfrac{1}{2} + 1 = \tfrac{3}{2}.$$