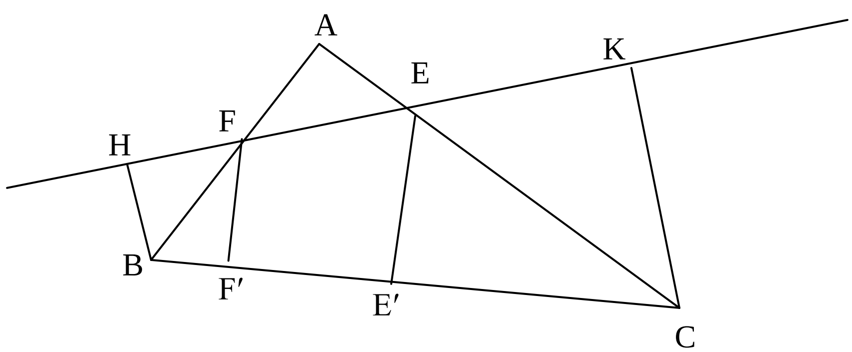
CONCURSUL JUDEŢEAN DE MATEMATICĂ
-In Memoriam „ION COJOCARU"-
9 mai 2015, clasa a VII-a
BAREM de CORECTARE şi NOTARE

Partea I (fiecare item 5 puncte)

1	2	3	4	5	6	7	8	9	10
D	C	D	A	C	A	D	A	B	A

Partea a II-a :

1



Fie K şi H simetricele punctelor E' şi F' faţă de AC, respectiv AB...6 p
$\Delta E'CK, \Delta E'EK$ isoscele $\Rightarrow EE' = EK$ şi $m(\angle E'CE) = m(\angle ECK) = m(\angle AFE) = b$,
$m(\angle E'EC) = m(\angle CEK) = 90^0 - B = m(\angle AEF) = m(\angle ABC)$, deci $\angle KEC \equiv \angle AEF \Rightarrow K, F, E$ coliniare... ...6 p
analog H, E, F coliniare şi $FF' = HF$
$EE' + EF + FF' = KE + EF + FH = HK$ .... .4 p
$HBCK$ trapez dreptunghic $\Rightarrow HK \leq BC$ .... .2 p
Egalitatea are loc dacă $HBCK$ dreptunghi $\Rightarrow EF \parallel BC \Rightarrow \Delta ABC$ dr isoscel.......................2 p

2. a) $(1+\frac{1}{x}-\frac{1}{x+1})^2 = (1+\frac{1}{x})^2 - 2\frac{x+1}{x}\cdot\frac{1}{x+1} + \frac{1}{(x+1)^2} = 1+\frac{1}{x^2}+\frac{2}{x}-\frac{2}{x}+\frac{1}{(x+1)^2} = 1+\frac{1}{x^2}+\frac{1}{(x+1)^2}$ ..6p.

b) $\frac{1}{a}(\frac{1}{a^2}+\frac{1}{b^2}+1)+\frac{1}{b}(\frac{1}{a^2}+\frac{1}{b^2}+1)-(\frac{1}{a^2}+\frac{1}{b^2}+1)>0$ 6p

$(\frac{1}{a^2}+\frac{1}{b^2}+1)(\frac{1}{a}+\frac{1}{b}+1)>0$ 4p

$(\frac{1}{a^2}+\frac{1}{b^2}+1)>0 \Rightarrow \frac{1}{a}+\frac{1}{b}-1>0, echivalent\ \frac{a+b}{ab}>1$ 2p

De aici, daca adica ab>0 obtinem a+b>ab, iar daca ab<0 obtinem a+b<ab…….. 2p