Barem Clasa a V a, Olimpiada Locală de Matematică

SUBIECTUL I

Se scrie teorema împărțirii cu rest : n:17 = c_1 + 11, n:13=c_2 +11 (2 punct)

n-11= 17.c_1 , n-11= 13.c_2 (2punct)

[17, 13] = 17.13 =221 (1 punct)

n-11 = 221 , n = 221+11, n = 232 (2 puncte)

SUBIECTUL 2

Soluție:

$\overline{abc}$ =6·$\overline{bc}$+5..1p

100· a+$\overline{bc}$ =6·$\overline{bc}$ +5..1p

100 ·a=5·$\overline{bc}$ +5..1p

20· a=$\overline{bc}$ +1...1p

a≤5...1p

$\overline{abc}$ ∈{119,239,359,479,599}..2p

SUBIECTUL 3

$$S=\underbrace{9+9+\ldots+9}_{de\ 29\ de\ ori}+\underbrace{8+8+\ldots+8}_{de\ 28\ de\ ori}\ldots\ldots+\underbrace{2+2+\ldots+2}_{de\ 22\ de\ ori}+\underbrace{1+1+\ldots+1}_{de\ 21\ de\ ori}=$$

$= 9\cdot29+8\cdot28+\ldots+2\cdot22+1\cdot21$ 2 p

$$=9\cdot(20+9)+8\cdot(20+8)+\ldots+2\cdot(20+2)+1\cdot(20+1)$$

$$=9\cdot20+9^2+8\cdot20+8^2+\ldots+2\cdot20+2^2+1\cdot20+1^2$$

2 p

$$=20\cdot(9+8+\ldots+2+1)+9^2+8^2+\ldots+2^2+1^2=20\cdot\frac{9\cdot10}{2}+9^2+8^2+\ldots+2^2+1^2$$

$=900+9^2+8^2+\ldots+2^2+1^2=30^2+9^2+8^2+\ldots+2^2+1^2$. 3 p

SUBIECTUL 4

a. $A=2020\left(1+2019\right)=2020\cdot 2020=2020^2$ 2p

b. $B=2020^2+2019\cdot 2020^2=2020^2\left(1+2019\right)=2020^3$ 2p

c. $C=2020^{2022}=\left(2020^{1011}\right)^2=\left(2020^{674}\right)^3$ 3p

Baremul este orientativ, orice alta varianta corecta se va puncta corespunzator