

Concursul Național de Matematică Aplicată ” Adolf Haimovici ”,

16 februarie 2013

filierea tehnologic: toate profilurile

cl. a IX-a

Varianta 3

**Barem**

1.a) .

$$|x-1| \geq 0, |x-2| \geq 0$$

$$|x-1|+|x-2|=0 \Leftrightarrow |x-1|=0 \text{ si } |x-2|=0 \Leftrightarrow x=1 \text{ si } x=2$$

$\Rightarrow x$  nu poate lua in acelasi timp doua valori astfel ca  $|x-1|+|x-2|=0$

$\Rightarrow F$

$$1.b). 5^8 - 2^8 = (5^4 - 2^4)(5^4 + 2^4) \Rightarrow \text{se descompune} \Rightarrow \text{nu este prim} \Rightarrow F$$

1.c). Se reprezinta punctele  $\Rightarrow A$

2.a) .

$$\text{Se determina } E = 4\{a\} + [3a] + [a] \Rightarrow E = -2,8$$

$$\text{Se determina } F = \{3b\} + [b] + \{b\}$$

$$\{b\} = 0,8 \Rightarrow \{3b\} = 0,4 \Rightarrow F = 1,2$$

$$2.b). |E-F| = |-2,8-1,2| = |-4| = 4$$

3.

$$\text{pt. } n=1 \Rightarrow S_1 + S_2 = 4 \Rightarrow a_1 + a_1 + a_2 = 4 \Rightarrow 2a_1 + a_2 = 4$$

$$\text{pt. } n=2 \Rightarrow S_2 + S_3 = 9 \Rightarrow 2a_1 + 2a_2 + a_3 = 9 \Rightarrow a_2 + a_3 = 5$$

se aplica  $a_n = a_1 + (n-1)r$

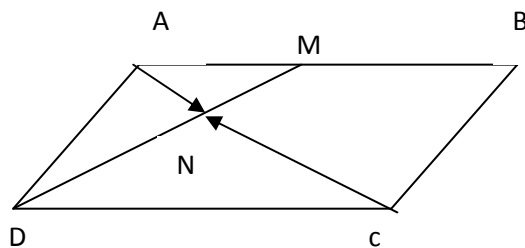
$$\text{din } 2a_1 + a_2 = 4 \Rightarrow 3a_1 + r = 4$$

$$\text{din } a_2 + a_3 = 5 \Rightarrow 2a_1 + 3r = 5 \Rightarrow$$

se rezolva  $\begin{cases} 3a_1 + r = 4 \\ 2a_1 + 3r = 5 \end{cases} \Rightarrow r=1, a_1=1$

$\Rightarrow an=n$

4. Desen:



Folosind operatiile cu vectori  $\Rightarrow \vec{AN} = \vec{AM} + \vec{MN}$  si  $\vec{CN} = \vec{CD} + \vec{DN}$ .

Se inmulteste prima relatie cu 2 si se aduna cu a doua  $\Rightarrow$

$$2\vec{AN} + \vec{CN} = 2\vec{AM} + 2\vec{MN} + \vec{CD} + \vec{DN} = 2\vec{AM} + 2\vec{MN} - 2\vec{AM} - 2\vec{MN} = \vec{0}, \Rightarrow$$

$2\vec{AN} + \vec{CN} = \vec{0} \Rightarrow \vec{AN}$  si  $\vec{CN}$  coliniari  $\Rightarrow$  punctele A,N,C coliniare.