FOLOSIREA PROPR. DE ÎNZESTRARE

Determinați mulțimile:

1) $A=\{n\in\mathbb{N} \mid n=\frac{3x+2}{2x+3}, x\in\mathbb{Z}\}$

2) $A=\{n\in\mathbb{Z} \mid n=\frac{4x-5}{5x+1}, x\in\mathbb{Z}\}$

3) $A=\{n\in\mathbb{Z} \mid n=\frac{5x+2}{3x-4}, x\in\mathbb{N}\}$

4) $A=\{n\in\mathbb{N} \mid n=\frac{4x-1}{3x-5}, x\in\mathbb{Z}\}$

5) $A=\{n\in\mathbb{N} \mid n=\frac{3x-7}{2x+1}, x\in\mathbb{N}\}$

6) $A=\{n\in\mathbb{Z} \mid n=\frac{5x-8}{2x+1}, x\in\mathbb{Z}\}$

7) $A=\{n\in\mathbb{N} \mid n=\frac{4x-3}{3x+1}, x\in\mathbb{N}\}$

8) $A=\{n\in\mathbb{Z} \mid n=\frac{3x-1}{2x+7}, x\in\mathbb{N}\}$

9) $A=\{n\in\mathbb{N} \mid n=\frac{4x-3}{2x+1}, x\in\mathbb{Z}\}$

10) $A=\{n\in\mathbb{Z} \mid n=\frac{2x-1}{3x+2}, x\in\mathbb{N}\}$

Prof. Ovidiu Bădescu

Găsiți mulțimea

$$A = \{ n \in \mathbb{N} \mid n = \frac{3x+2}{2x+3},\ x \in \mathbb{Z} \}$$

$E_1)$ $2x+3 \mid 3x+2 \Rightarrow 2x+3 \mid 2(3x+2)$

Dar, $2x+3 \mid 2x+3 \Rightarrow 2x+3 \mid 3(2x+3)$

$$\Rightarrow \begin{matrix} 2x+3 \mid 6x+4 \\ 2x+3 \mid 6x+9 \end{matrix}$$

$$\Rightarrow 2x+3 \mid (6x+9)-(6x+4)$$

$$\Rightarrow 2x+3 \mid 5 \Rightarrow 2x+3 \in D_5$$

$E_2)$ $2x+3 \in \{ \pm 1; \pm 5 \}$

$2x+3=1 \Rightarrow x=-1 \in \mathbb{Z} \Rightarrow n = \frac{-3+2}{-2+3} = -1 \notin \mathbb{N}$

$2x+3=5 \Rightarrow x=1 \in \mathbb{Z} \Rightarrow n = \frac{3+2}{2+3} = 1 \in \mathbb{N}$ ok.

$2x+3=-1 \Rightarrow x=-2 \in \mathbb{Z} \Rightarrow n = \frac{-6+2}{-4+3} = 4 \in \mathbb{N}$ ok.

$2x+3=-5 \Rightarrow x=-4 \in \mathbb{Z} \Rightarrow n = \frac{-10}{-5} = 2 \in \mathbb{N}$ ok.

$E_3)$ $A = \{ 1; 2; 4 \}$

Obs.: s-au folosit:

1) $A \mid A$

2) $A \mid B \Rightarrow A \mid (n \cdot B),\ n \in \mathbb{Z}$

3) $\left.\begin{matrix} A \mid B \\ A \mid C \end{matrix}\right\} \Rightarrow \begin{matrix} A \mid (B+C) \\ A \mid (B-C) \end{matrix}$

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Găsiți $A=\{n\in\mathbb{Z} \mid n=\frac{4x-5}{5x+1}, x\in\mathbb{Z}\}$

$E_1)$ $5x+1 \mid 4x-5 \Rightarrow 5x+1 \mid 5(4x-5)$

Dar, $5x+1 \mid 5x+1 \Rightarrow 5x+1 \mid 4(5x+1)$

$$\Rightarrow \begin{cases} 5x+1 \mid 20x-25 \\ 5x+1 \mid 20x+4 \end{cases}$$

$$\Rightarrow 5x+1 \mid (20x-25)-(20x+4)$$

$$\Rightarrow 5x+1 \mid -29 \Rightarrow 5x+1 \in D_{-29}$$

$E_2) \Rightarrow 5x+1 \in \{\pm 1; \pm 29\}$

$5x+1=1 \Rightarrow x=0 \in\mathbb{Z} \Rightarrow n=\frac{4\cdot 0-5}{5\cdot 0+1} \Rightarrow n=-5\in\mathbb{Z}$ OK. $\Rightarrow$ K. O.

$5x+1=-1 \Rightarrow x=-\frac{2}{5}\notin\mathbb{Z}$ $\Rightarrow$ K. O.

$5x+1=29 \Rightarrow x=\frac{28}{5}\notin\mathbb{Z}$

$5x+1=-29 \Rightarrow x=-6\in\mathbb{Z} \Rightarrow n=\frac{4\cdot(-6)-5}{5\cdot(-6)+1}=\frac{-29}{-29}=1\in\mathbb{Z}$ OK.

$E_3)$ $A=\{-5; 1\}$

Obs.: S-au folosit:

1) $A \mid A$

2) $A \mid B \Rightarrow A \mid n\cdot B$, $n\in\mathbb{Z}$

3) $\begin{matrix} A\mid B \\ A\mid C \end{matrix} \Rightarrow \begin{matrix} A\mid (B+C) \\ A\mid (B-C) \end{matrix}$

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