CLASA A VII-A
BAREME

SUBIECTUL 1.

a)

x + y =1 + 1+ 1 = 3………………………………………………… 1 punct

$x \neq y$ ……………………………………………………………….. 1 punct

x, y $\in A \subset \mathbb{N} \Rightarrow x=1,\ y=2\ sau\ x=2,\ y=1$ ……………………………… 2 puncte

$x \cdot y = 2$ ………………………………………………………………. 2 puncte

b)

$m \cdot n \cdot p \cdot q = 1$ ………………………………………………………. 1 punct

$m,\ n,\ p,\ q \in A \subset \mathbb{N} \Rightarrow m=n=p=q=1$ ……………………………... 1 punct

$a^4 = m \cdot abcd,\ b^4 = n \cdot abcd,\ c^4 = p \cdot abcd,\ d^4 = q \cdot abcd$ ………………….. 2 puncte

$a^4 + b^4 + c^4 + d^4 = abcd \cdot (m+n+p+q) = 4abcd$ ………………………… 2 puncte

c)

$\frac{1}{u} + \frac{1}{w} = \frac{1}{2014} \Big| \cdot 2014uw$ ………………………………………………. 2 puncte

$2014u + 2014w = uw$ ……………………………………………………. 1 punct

$uw - 2014u - 2014w + 2014^2 = 2014^2$ …………………………….... 2 puncte

$(u-2014)(w-2014) = 2014^2$ ……………………………………………... 2 puncte

$\sqrt{(u-2014)(w-2014)} = 2014$ ……………………………………………. 1 punct

SUBIECTUL 2.

1.

Între două numere reationale pozitive se află cel puţin două numere naturale dacă diferenţa lor este mai mare sau egală cu 2………………….. 4 puncte

$\frac{n}{5} - \frac{n}{7} > 2 \Big| \cdot 35$ …………………………………………………………… 2 puncte

$7n - 5n > 70$ ……………………………………………………………….. 1 punct

$n > 35$………………………………………………………………………… 1 punct

2.

x = nr. mere Darius, y = nr. mere Emi, z = nr. mere Ilias

$\left.\begin{array}{l} x+y+z=n \\ y=3x \end{array}\right\}$ ………………………………………………………… 2 puncte

$z = n - 4x$ …………………………………………………………………... 1 punct

$x < z < y \Rightarrow 5x < n < 7x$ ……………………………………………… 1 punct

$x < \frac{n}{5};\ x > \frac{n}{7}$ …………………………………………………………….. 2 puncte

x soluţie unică, $\frac{n}{7} < x < \frac{n}{5} \overset{1.}{\Rightarrow} \frac{n}{5} - \frac{n}{7} \leq 2$ ……………………………….. 2 puncte

$\left.\begin{array}{l} n \leq 35 \\ n = \max \end{array}\right\} \Rightarrow n = 35$ ……………………………………………… 2 puncte

Verificare………………………………………………………………… 2 puncte

SUBIECTUL 3.

1.

Fie a', b', c' lungimile liniilor mijlocii ale triunghiului dat

Verificarea inegalităţii între laturile triunghiului

$\left.\begin{matrix} a' = b' = 3 \\ c' = 7 \\ a' + b' > c' \end{matrix}\right\} \Leftrightarrow 3 + 3 > 7 \ \textit{fals}$ .... 2 puncte

$\left.\begin{matrix} a' = b' = 7 \\ c' = 3 \\ a' + b' > c' \\ a' + c' > b' \end{matrix}\right\} \Leftrightarrow \begin{cases} 7 + 7 > 3 \\ 7 + 3 > 3 \end{cases}$ .... 2 puncte

$\left.\begin{matrix} a = b = 14 \\ c = 6 \end{matrix}\right\} \Rightarrow P = 34$ .... 1 punct

2.

$L \cdot l = 2(L + l)$ .... 1 punct

$L \cdot l - 2L - 2l = 0$ .... 1 punct

$(L - 2)(l - 2) = 4$ .... 1 punct

$L,\ l \in \mathbb{N} \Rightarrow \begin{cases} L - 2 = 4 \\ l - 2 = 1 \end{cases} \Rightarrow \begin{cases} L = 6 \\ l = 3 \end{cases}$ .... 1 punct

$L,\ l \in \mathbb{N} \Rightarrow \begin{cases} L - 2 = 2 \\ l - 2 = 2 \end{cases} \Rightarrow \begin{cases} L = 4 \\ l = 4 \end{cases}$ .... 1 punct

3.

$m(\sphericalangle EBA) = \dfrac{m(\sphericalangle B)}{2} = 15^0$ .... 2 puncte

$\left.\begin{matrix} m(\sphericalangle FAB) = 60^0 \\ m(\sphericalangle BAD) = 45^0 \end{matrix}\right\} \Rightarrow m(\sphericalangle FAD) = 15^0$ .... 2 puncte

$\left.\begin{matrix} \sphericalangle EAB \equiv \sphericalangle FAD \\ \sphericalangle EAB \equiv \sphericalangle AFD \end{matrix}\right\} \overset{U.U.}{\Rightarrow} \Delta AFD \sim \Delta BAE$ .... 2 puncte

$\left.\begin{matrix} \Delta ABF \\ m(\sphericalangle B) = 30^0 \\ m(\sphericalangle F) = 90^0 \end{matrix}\right\} \Rightarrow \dfrac{AF}{AB} = \dfrac{1}{2}$ .... 1 punct

$\Delta AFD \sim \Delta BAE \Rightarrow \dfrac{AF}{AB} = \dfrac{AD}{BE} = \dfrac{1}{2}$ .... 2 puncte

$BE = 2AD$ .... 1 punct