



CLASAA VI-A  
SUBIECTE

SUBIECTUL 1.

1)  $p = n \cdot n + 1, n \in \mathbb{N}$  .....1P

$n = 2k \Rightarrow p = 2k \cdot k + 1 \stackrel{:2}{\Rightarrow} p \text{ par}$  .....2P

$n = 2k + 1 \Rightarrow p = 2k + 1 \cdot 2k + 2 = 2 \cdot 2k + 1 \cdot k + 1 \stackrel{:2}{\Rightarrow} \text{par}$  .....2P

2)  $a^2 + a = a \cdot a + 1, b^2 + b = b \cdot b + 1$  nr. pare .....1P

$\frac{a^2 + a}{2} \in \mathbb{N}, \frac{b^2 + b}{2} \in \mathbb{N}$  .....1P

$\frac{c+3}{c+1} = 1 + \frac{2}{c+1} \in \mathbb{N}$  .....1P

$c+1 \in D_2, c \in \mathbb{N}^* \Rightarrow c = 1$  .....1P

$a \cdot a + 1 + b \cdot b + 1 = 4$  .....1P

$a \cdot a + 1 = b \cdot b + 1 = 2$  .....1P

Finalizare  $a = b = c = 1$  .....1P

3)  $x + y + z + \frac{\overline{yz} + \overline{zx} + \overline{xy}}{99} = x + y + z + 1$  .....3P

$11x + 11y + 11z = 99 \Rightarrow x + y + z = 9$  .....2P

$x < y < z, x + y + z = 9 \Rightarrow x = 1, y = 2, z = 6$  .....2P

$x = 1, y = 3, z = 5$

$\overline{xyz} = 135$  sau  $\overline{xyz} = 126$  .....1P

SUBIECTUL 2.

1.  $\frac{3a}{2} = \frac{4b}{3} = \frac{5c}{4} = k \Rightarrow a = \frac{2k}{3}, b = \frac{3k}{4}, c = \frac{4k}{5}$  .....2P

$$k = \frac{4}{11} \dots\dots\dots 2P$$

$$3a - 3b + 5c = \frac{15}{11} \dots\dots\dots 1P$$

$$\frac{4}{3} < \frac{15}{11} \Leftrightarrow \frac{44}{33} < \frac{45}{33} \dots\dots\dots 2P$$

$$\frac{15}{11} < \frac{7}{5} \Leftrightarrow \frac{75}{55} < \frac{77}{55} \dots\dots\dots 2P$$

Finalizare ..... 1P

2) Notăm  $a$  = numărul locuitorilor din satul A și cu  $b$  = numărul locuitorilor din satul B

$$\frac{60}{100}a + \frac{75}{100}b = \frac{69}{100}a + b \dots\dots\dots 3P$$

$$2b = 3a \dots\dots\dots 2P$$

$$\frac{p}{100}b = a \dots\dots\dots 3P$$

Finalizare  $p = 66, 6 \%$  ..... 2P

**SUBIECTUL 3.**

1.  $A_2A_3 = 2A_1A_2; A_3A_4 = 2A_2A_3 \dots\dots\dots 2P$

$$A_{2014}A_{2015} = 2^{2013} \dots\dots\dots 3P$$

$$A_0A_{2015} = 1 + 1 + 2 + 2^2 + \dots + 2^{2013} \dots\dots\dots 2P$$

Finalizare  $A_0A_{2015} = 2^{2014} \dots\dots\dots 3P$

2.

a)  $m \sphericalangle AOC = m \sphericalangle AOB - m \sphericalangle BOC = 39^\circ 44' 30'' \dots\dots\dots 1P$

$$m \sphericalangle AOD = m \sphericalangle COD - m \sphericalangle AOC = 40^\circ 15' 30'' \dots\dots\dots 1P$$

$$m \sphericalangle BOD = m \sphericalangle AOB - m \sphericalangle AOD = 139^\circ 44' 30'' \dots\dots\dots 1P$$

$$m \sphericalangle MON = m \sphericalangle MOD + m \sphericalangle AOD + m \sphericalangle AON \dots\dots\dots 1P$$

$$m \sphericalangle MON = 130^\circ \dots\dots\dots 1P$$

b)  $[OE, OD - \text{semidrepte opuse} \Rightarrow D - O - E \dots\dots\dots 1P$

$$\sphericalangle AOB \text{ alungit} \Rightarrow A - O - B \dots\dots\dots 1P$$

$$\sphericalangle BOE, \sphericalangle AOD - \text{unghiuri opuse la vârf} \dots\dots\dots 2P$$

$$m \sphericalangle BOE = m \sphericalangle AOD = 40^\circ 15' 30'' \dots\dots\dots 1P$$