

CLASA A IX-A - BAREM.

SUBIECTUL 1.

$n=1$ (1 punct)

$$\sqrt{(n+1)(n+2)} + \frac{n(n+2)}{2} <$$

$$\frac{(n+1)(n+3)}{2} \quad (2 \text{ puncte})$$

$$\sqrt{(n+1)(n+2)} < n + \frac{3}{2} \quad (2 \text{ puncte})$$

$$2 < 9/4 \quad (2 \text{ puncte})$$

SUBIECTUL 2

$$a = b_1 q^{m-1}, \quad b = b_1 q^{n-1},$$

$$c = b_1 q^{p-1} \quad (2 \text{ puncte})$$

$$[b_1 q^{m-1}]^{n-p} \dots \quad (2 \text{ puncte})$$

$$= (b_1^{n-p} \dots) \cdot (q^{(m-1)(n-p)} \dots) \quad (2 \text{ puncte})$$

$$= b_1^0 \cdot q^0 = 1 \quad (1 \text{ punct})$$

SUBIECTUL 3

Soluție. Cu notațiile $a = \frac{1}{x}$, $b = \frac{1}{y}$, $c = \frac{1}{z}$, avem

$$\frac{1}{-4b+3a} = \frac{1}{-3c+4b} = \frac{1}{2a-3c} = \frac{1}{14} \left(\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2} \right). \quad 1 \text{ punct}$$

$$a = 2b, \quad c = \frac{2}{3}b$$

2 puncte

$$\frac{1}{-4b+6b} = \frac{1}{14} \left(\frac{1}{4b^2} + \frac{1}{b^2} + \frac{9}{4b^2} \right) \quad 2 \text{ puncte}$$

$$\Rightarrow b = \frac{1}{2}, \quad a = 1, \quad c = \frac{1}{3} \Rightarrow x = 1, \quad y = 2, \quad z = 3.$$

2 puncte

SUBIECTUL 4

Soluție. Fie X un punct în planul triunghiului ABC . Atunci

$$2 \text{ puncte} \quad 3\overrightarrow{XG} = \overrightarrow{XA} + \overrightarrow{XB} + \overrightarrow{XC} \text{ și } 3\overrightarrow{XG'} = \overrightarrow{XA_1} + \overrightarrow{XB_1} + \overrightarrow{XC_1} =$$

$$2 \text{ puncte} = \frac{1}{3} (\overrightarrow{XA} + \overrightarrow{XB} + \overrightarrow{XM} + \overrightarrow{XB} + \overrightarrow{XC} + \overrightarrow{XN} + \overrightarrow{XC} + \overrightarrow{XA} + \overrightarrow{XP}) =$$

$$2 \text{ puncte} = 2 \frac{\overrightarrow{XA} + \overrightarrow{XB} + \overrightarrow{XC}}{3} + \frac{\overrightarrow{XM} + \overrightarrow{XN} + \overrightarrow{XP}}{3} = 2\overrightarrow{XG} + \overrightarrow{XG'},$$

$$\text{de unde } \overrightarrow{G'G''} = \frac{2\overrightarrow{GG''}}{3}. \quad 1 \text{ punct}$$