H. MEDII

1) Calculati media aritmetica si media geometrica a numerelor **a** si **b** unde:

$$a=\sqrt{625}-\sqrt{102,01}:\left(4\frac{1}{2}+3\frac{1}{2}:\frac{5}{8}\right) \text{ si } b=\frac{2,5-5,(6)}{-19}+\sqrt{0,69(4)}+\sqrt{25}$$

REZOLVARE

Calculez numerele **a** si **b**

$$\sqrt{102,01}=\sqrt{\frac{10201}{100}}=\frac{\sqrt{10201}}{\sqrt{100}}=\frac{101}{10} \quad ; \quad 5,(6)=\frac{56-5}{9}=\frac{51^{(3}}{9}=\frac{17}{3} \quad ; \quad 2,5=\frac{25^{(5}}{10}=\frac{5}{2}$$

$$0,69(4)=\frac{694-69}{900}=\frac{625^{(25}}{900}=\frac{25}{36} \Rightarrow \sqrt{0,69(4)}=\sqrt{\frac{25}{36}}=\frac{5}{6}$$

$$a=25-\frac{101}{10}:\left(\frac{9}{2}+\frac{7}{\cancel{2}}\cdot\frac{\cancel{8}^{4}}{5}\right)=25-\frac{101}{10}:\left(\frac{{}^{5)}9}{2}+\frac{{}^{2)}28}{5}\right)=25-\frac{101}{10}:\frac{45+56}{10}=25-\frac{\cancel{101}}{\cancel{10}}\cdot\frac{\cancel{10}}{\cancel{101}}=$$

$$=25-1=24 \Rightarrow \mathbf{a=24}$$

$$b=\left(\frac{{}^{3)}5}{2}-\frac{{}^{2)}17}{3}\right)\cdot\left(-\frac{1}{19}\right)+\frac{5}{6}+5=\left(\frac{15-34}{6}\right)\cdot\left(-\frac{1}{19}\right)+\frac{5}{6}+5=\left(-\frac{\cancel{19}}{6}\right)\cdot\left(-\frac{1}{\cancel{19}}\right)+\frac{5}{6}+5=$$

$$=\frac{1}{6}+\frac{5}{6}+5=\frac{6}{6}+5=1+5=6 \Rightarrow \mathbf{b=6}$$

$$\mathbf{m_a=\frac{a+b}{2}}=\frac{24+6}{2}=\frac{30}{2}=\mathbf{15} \quad ; \quad \mathbf{m_g=\sqrt{a\cdot b}}=\sqrt{24\cdot 6}=\sqrt{4\cdot 6\cdot 6}=2\cdot 6=\mathbf{12}$$

2) Suma a trei numere este 34. Daca media aritmetica dintre primele doua este 5 iar media geometrica dintre ultimele doua este 12, aflati cele 3 numere.

REZOLVARE

Notez cele 3 numere cu a, b, c si formez urmatoarele ecuatii:

$a+b+c=34 \Rightarrow a+b+c=34 \quad (1)$

$$\frac{a+b}{2}=5 \Rightarrow a+b=10 \quad (2)$$

$\sqrt{b\cdot c}=12 \Rightarrow b\cdot c=144 \quad (3)$

Inlocuiesc relatia (2) in relatia (1) $\Rightarrow$ 10 + c =34 $\Rightarrow$ **c = 24**
Inlocuiesc **c** in relatia (3) $\Rightarrow$ b · 24 = 144 / :24 $\Rightarrow$ **b = 6**
Inlocuiesc **b** in relatia (2) $\Rightarrow$ a + 6 = 10 $\Rightarrow$ **a = 4**

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3) Daca se amesteca 23litri apa cu temperatura de 65° cu 17litri de apa cu temperatura de 95°, cit va fi temperatura amestecului rezultat?

REZOLVARE

In acest tip de probleme se utilizeaza media aritmetica ponderata, unde ponderile sunt cantitatile de solutii care se amesteca

$$\textbf{Temperatura amestecului} = \frac{65\cdot 23 + 95\cdot 17}{23 + 17} = \frac{3110}{40} = 77{,}75°$$

4) 40 Kg de mere au fost vandute cu 8.000 lei, iar 60 Kg au fost vandute cu 6.000 lei. Care este pretul mediu obtinut.

REZOLVARE

Ponderile sunt reprezentate de cantitatile de mere vandute

$$\text{Pretul mediu} = \frac{8000\cdot 40 + 6000\cdot 60}{40 + 60} = \frac{100\cdot(80\cdot 40 + 60\cdot 60)}{100} = 3200 + 3600 = \textbf{6800 lei}$$

5) Media armonica a 2 numere este $\frac{24}{5}$, iar media aritmetica a lor este 5. Calculati media geometrica a celor doua numere.

REZOLVARE

Metoda 1.

Notez cele 2 numere cu **a** si **b**

$$\mathbf{m_h = \frac{2\cdot a\cdot b}{a + b}} \Rightarrow \frac{24}{5} = \frac{2\cdot a\cdot b}{a + b} \quad (1)$$

$$\frac{\mathbf{a + b}}{\mathbf{2}} = \mathbf{5} \Rightarrow a + b = 10 \quad (2)$$

Inlocuiesc relatia (2) in relatia (1) $\Rightarrow \frac{24}{5} = \frac{2\cdot a\cdot b}{10} \Rightarrow 2\cdot a\cdot b\cdot 5 = 24\cdot 10 \Rightarrow a\cdot b = \frac{24\cdot 10}{10} \Rightarrow a\cdot b = 24$

Media geometrica $= \sqrt{a\cdot b} \Rightarrow \mathbf{M_g} = \sqrt{24} = \mathbf{2\sqrt{6}}$

Metoda 2. (VALABILA DOAR IN CAZUL A 2 NUMERE !)

$$\mathbf{m_g = \sqrt{a\cdot b} \Rightarrow a\cdot b = m_g^2} \quad ; \quad \mathbf{m_a = \frac{a + b}{2} \Rightarrow a + b = 2\cdot m_a}$$

$$\mathbf{m_h = \frac{2\cdot a\cdot b}{a + b} \Rightarrow m_h = \frac{2\cdot m_g^2}{2\cdot m_a} \Rightarrow m_h = \frac{m_g^2}{m_a}} \Rightarrow \frac{24}{5} = \frac{m_g^2}{5} \Rightarrow m_g^2 = 24 \Rightarrow m_g = \sqrt{24} \Rightarrow \mathbf{m_g = 2\sqrt{6}}$$

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