

Olimpiada de Matematică
Faza locală
Clasa a VI-a
Barem de corectare



Nr. problemei	Solutie/ rezolvare	Punctaj
1	<p>a) $N = \overbrace{a00\dots0}^n b - \overline{ab} = \overbrace{a00\dots0}^{n+1} + b - 10a - b = 10^{n+1}a - 10a$</p> <p>$= 10a(10^n - 1) = 10 \cdot a \cdot \underbrace{99\dots9}_n \Rightarrow N:9$ si $N:5$</p> <p>Cum $(5,9) = 1 \Rightarrow N:45$</p> <p>b) Din $3a + b:7$ si $7a + 7b:7 \Rightarrow 4a + 6b:7$ $\Rightarrow 2(2a + 3b):7 \Rightarrow 2a + 3b:7 \Rightarrow$ fractia se simplifica prin 7</p>	<p>1p</p> <p>1p</p> <p>1p</p> <p>2p</p> <p>2p</p>
2	<p>Din $\frac{3a + 2b}{6} = \frac{3b + c}{7} \Rightarrow 21a = 2(2b + 3c) \Rightarrow 2 / 21a$</p> <p>Cum $(21, 2) = 1 \Rightarrow 2 / a$ Dar a este numar prim deci a = 2</p> <p>Din $\frac{3a + 2b}{6} = \frac{a + 4c}{11}$ si a = 2 $\Rightarrow 11b = 3(4c - 9) \Rightarrow 3 / 11b$</p> <p>Cum $(3, 11) = 1 \Rightarrow 3 / b$ Dar b este numar prim deci b=3</p> <p>Din relatia $21a = 2(2b + 3c) \Rightarrow c = 5$</p>	<p>2p</p> <p>1p</p> <p>2p</p> <p>1p</p> <p>1p</p>
3	<p>a) Fie $AB = CD = EF = a$ si $BC = DE = FG = b \Rightarrow 3a + 3b = 24 \Rightarrow a + b = 8$cm Atunci $BF = 2a + 2b = 2(a + b) = 16$ cm $EG = a + b = 8$ cm</p> <p>b) $\frac{a + b}{2} + a + \frac{2b + a}{2} = 13,5 \Rightarrow$ $a + 3(a + b) = 27 \Rightarrow a + 24 = 27 \Rightarrow a = 3$cm</p>	<p>1p</p> <p>1p</p> <p>1p</p> <p>2p</p> <p>2p</p>
4	<p>Fie $m(\sphericalangle AOX) = m(\sphericalangle XOD) = a$ si $m(\sphericalangle COY) = m(\sphericalangle YOY) = b$</p> <p>$m(\sphericalangle AOC) = 180^\circ - 2b$</p> <p>$m(\sphericalangle DOB) = 180^\circ - 2a$</p> <p>$\Rightarrow 90^\circ = 360^\circ - 2(a + b) \Rightarrow a + b = 135^\circ$</p> <p>$\Rightarrow m(\sphericalangle XOY) = 180^\circ - (a + b) \Rightarrow m(\sphericalangle XOY) = 45^\circ$</p>	<p>2p</p> <p>1p</p> <p>2p</p> <p>2p</p>