Barem de corectare OLM 2018 Clasa a VI-a

P1 – autor Iustina Albu

$d=(3n+7,7n+12)$, atunci $d\mid 3n+5,\ d\mid 7n+12$	**3p**
$d\mid 21n+35,\ d\mid 21n+36 \Rightarrow d\mid 1$	**3p**
$d=1$, deci fracția este ireductibilă.	**1p**

P2 – autor Adina Oancea

a) $A_1A_{2017}=A_1A_2+A_2A_3+...+A_{2016}A_{2017}=\frac{1}{1\cdot 2}+\frac{1}{2\cdot 3}+...+\frac{1}{2016\cdot 2017}$	**2p**
$A_1A_{2017}=1-\frac{1}{2017}=\frac{2016}{2017}$	**1p**
b) $A_1A_k=1-\frac{1}{k}=\frac{k-1}{k}$	**2p**
Dacă M este mijlocul lui A_1A_k, atunci $MA_k=\frac{k-1}{2k}$.	**1p**
$\frac{k-1}{2k}=\frac{9}{20}\Leftrightarrow k=10$	**1p**

P3 – autor Monica Guita

$A=\frac{2^{3k+3}-2^{3k+2}-2^{3k+1}+2^{3k-1}}{2^{2018}-2^{2017}+2^{2015}}=\frac{2^{3k-1}\cdot\left(2^4-2^3-2^2+1\right)}{2^{2015}\cdot\left(2^3-2^2+1\right)}=\frac{2^{3k-1}}{2^{2015}}$	**3p**
$A\in\mathbb{N}\Leftrightarrow 3k-1\geq 2015$	**2p**
$3k\geq 2016$, deci valoare minimă a lui k este 672.	**2p**

P4 – autor Marius Șandru (GM)

$m(\sphericalangle AOB)=2x>0\Rightarrow m(\sphericalangle AOC)=m(\sphericalangle COB)=x$	**1p**
$m(\sphericalangle AOD)=m(\sphericalangle DOC)=\frac{1}{2}x$	**1p**
$m(\sphericalangle DOE)=m(\sphericalangle EOB)=\frac{x+\frac{1}{2}x}{2}=\frac{3}{4}x$,	**1p**
$m(\sphericalangle EOF)=m(\sphericalangle FOA)=\frac{2x-\frac{3}{4}x}{2}=\frac{5}{8}x$	**1p**
$\frac{5}{8}x>\frac{1}{2}x$, deci $F\in \mathrm{Int}(\sphericalangle DOB)$	**1p**
$m(\sphericalangle AOD)+m(\sphericalangle DOF)=m(\sphericalangle AOF)$; $\frac{1}{2}x+5^0=\frac{5}{8}x\Leftrightarrow x=40^0$	**1p**
$m(\sphericalangle AOB)=80^0$	**1p**