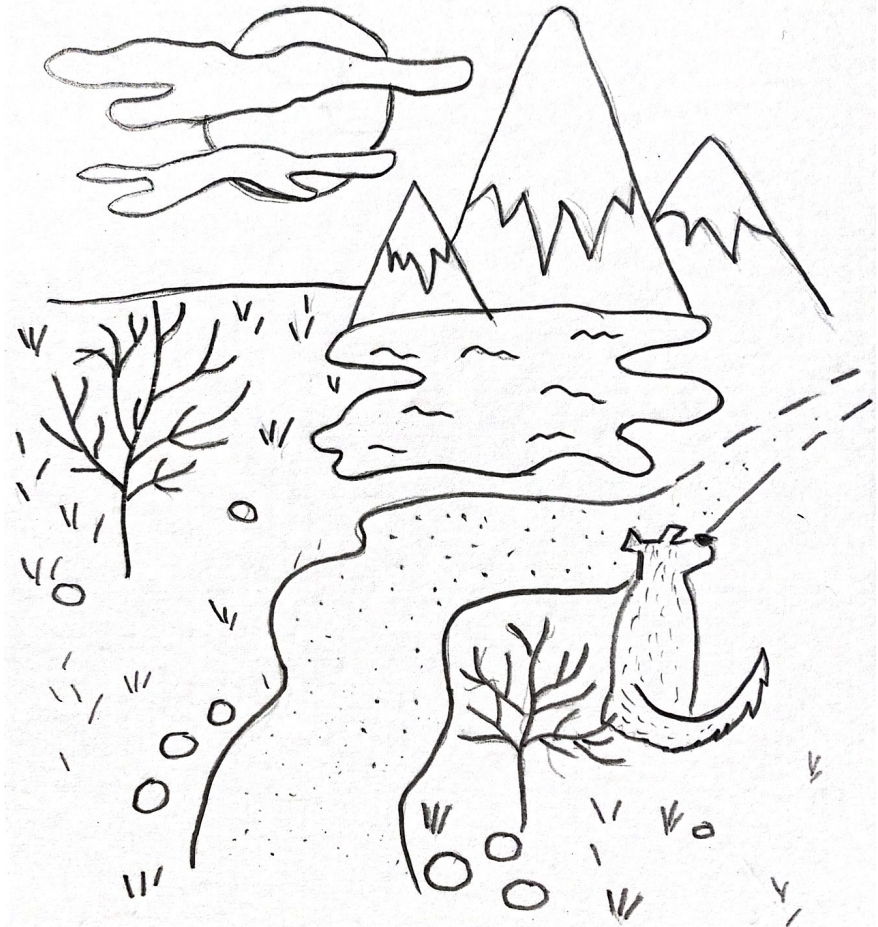


MATIK

Číslo 5 – Ročník 35

matik.strom.sk



Ahoj!

yfbU ~ ebP -@ <Uf^C^G^SWB y- YSC f% @ ^SC MATIK-> f Wbq\ ^-U@C ^SCC
ebq @C eb eqfCU s qSzbPzb sC\ Gszq >- Y- U^- C f bcpf qC C^Si] G-4 @ Uf -W
Cs\ CC zCY^ f ebY- sC-z- W-qSC^Ceb- f-U- e-szSs- @b @q-PCUs qG r q @bs b-
bc- Wf \ CyfbUC y- YSC qC C^S F

fC@ <SMATIK-

Ako bude

2% z daní

, UzC^zb qWUC \ b ^ fC^bf- |h ff ^SWBq <P eqe- @b-P @bW^<- - {hg @ ^
fCqU beqseC ^ \ bqL- ^S <S^ >- Ws\ C \ %
dC^S <C < sW^ < |h f% f \ C^- ebWpSC q- szS^ -W @bf seblC^ <P s - WsSz- \ S
eq f-s fWe qf- ^SC q- sbeSbf> eb zbf^ ><C^%<- s - S <P>- WsSz%<- s szqC@C
^S <P g
; P<C C f-s eqCb ebeqS>- 4%szC q@Sb\ > qY^b\ sfbUCU 4Y WU- U f< @S Y^CU
q@S %s- sC@b\ - ebWUC- U-@ \ ~yb\ ^- ~Y- Sebq eq- f Yb ^- SP - WsSz- <P
- ebeqS SSSP>- 4% sfbU- zq W- eb@ebqSS ^- ~ @b4qfb ^ <W qS^bs - eb\ bPY
z \ sWeS^C \ Y @ <P <SC- fC@b\ <P ~ @ <- 4G eCq- U <SP <Pb@z <Pzb -s^ <P sCQ
\ S^- qf> Wbq z W^ 4b ~UCG dbq eq- f UC S^ > qb eq f-s ^- \ C^- s szqC^C SC
qb f- \ @- f qC C^S YP sC S^- q- >- f% qC YS C S^ > Cz- Wb eb@ebqS - Uf- qx fbU
- eqseCU W \ %Y eY \ ~ zq- fC^S f- Pb fb ^ Pb q- s-i
dbzqC^ S^ Hq \ <S b zb\ >- W @ qf- |h > ^- UCzC ^- szq^WC ^- Pb <@- C^S
Pzzes=ww @q- <C^SG szqb\ i s Ws Ww @q- <C^SCw\ eCq <C^z- w- q @S f- \ b@ebfSC C
^- ~4bfb ^ bz- W@bP - @b\ ^- Ceb@ebq% U \ - SB\ ^- S^H2szqb\ i s W
p- WUC CF

Tábor mladých matematikov

, zCq\ ^Cb@c|i@bc_i --L-sz |C| s ~@CCzC^ ^- UCe z-4bqzbPzb qW y-4bq
\ Y @ <P \ - zC - zSWfF3- @Cs- W^ ^- ; P- zCp- @S eqb4<S, %<- rY^ -i, CzW%
eb@q4^ S^ Hq \ <C ^- UCzC f eb f- ^WC ^- sC\ S^- qi szqb\ i s W\ C@S- w-eYb- @sw
eb f- ^W- <- sz^SW \ \ |C| i e@H
d z- zC s- > qb UC y-4bq \ Y @ <P \ - zC - zSWfmTC zb z-4bq ~qC^ eqC 4-@ <SP
sC@ - Wf <- WY @ <P WY- eqC 4-@ <SP @q- P- Wf szqC^ <P WYf- > s- \ b qU C
eCfY <P- U <C qC^ W% fS < qC^ <P L% ^- <Sg d qLq \ z-4bq eqfb\ ^- b4 4C^
s szqC^C S > UC f- Wb @f- @^S @P >- eqCb b @f- @^SYe F
] Cf- P- UC eqf @Pb > We- <S- z-4bq UC b4\ C @ C^ -i yC \ Cs ^- f-sF

Vzorové riešenia 1. série úloh letného semestra

C beq fbf- Y-T-Δ pSP^ - fsW - , @CYObqf-zPbf- | - qC C
 ^- Wq USC qC C S=a YfCqrC - ^

Zadanie

] - z q eq Y - seb I @Cz f- seb c <PYeC- - seb c @Cfç- g | SWbq <PYe<S
 s- s ^SWbq \ S@Cfç- z- \ S<f z- Yb4Uz\ i , CzW%@fblS-G-Vzbq s- ^Cb4U YsSS4-
 eb@ Yq-W%ol C C ~@ çx@CS @b @fb<P sWe ^ z-W- 4%σ ^Sf W@^CUsWeS C
 ^CbYS@fC@CS-Vzbq sSsebY eb@ Yq-Wm, W-Δb>- Wm, W S>eqçbm

Riešenie

Šb <- @ ^S fC\ G> C @Cfç- s @Cfç- b\ - <PYeC< s <PYe<b\ sS~çS eb@ U
 q-W%eqçz b ^Gs\ 4%f S@^U<b sWe ^ @fC@Cfç- z- Y4b @f- U <PYe<S , 4%
 sSq-W%of q- <SsWeS%Δ bPY^Geb@ >\ ~sS 4%σeqçz f sWeS^C^- ^- Uf W@^b
 @Cfç- - W@^ <PYeC< f\ ~s- b4U g Vçy C \ → C @fC sWeS%σsebY f ^SP
 z- Wb\ ~ 4%σS- J @CS4G zbPb>- 4%σseb@ Yq-W%o f - W@Cz \ → C- seb I >
 - - W W VzbqUW fCWSWeS^C W@^b @C- fçS~ @Cfç- - Y4b <PYe<- geqç@ → G~çS C
 sSs ^SW\ eb@- q- Wi

Komentár

y-zb YP- ebzq-eSY Y^ \ -Y qC Sçbf>b çb\ sfC@ç ebçCz @Cç 4b@bf <P qC C i
 a 4ç- s s\ Cs- szçzYs z \ > CsSqC Sç f%4q YW@^ W^ Wq z^%eqe- @çx@CC^S @b
 sWe ^ - ^- zb\ zb çx@CC^ ^→ ~W<- Y CsS^SWb q-W%eb@+ , f - W\ %ebzçQ
 4-W C~W<- > Cz b eYz f @%σ eqç- W\ W fCWçx@CC^ i y- W<P eqe- @bf f - W
 4bY Y^ fC\ S\ -Y>eqçz\ C C<Pb@bzS> C YP- f→ eqç4Y\ %ΔC^- ç4SY çg

I beq fbf- Y, Sb KC Cqz - yS W r< Ysbf- | J qC C
 ^- Wq USC qC C S=] S- O-@Wb-

Zadanie

yçPbqY W%C, @CY3S - X-U- q @%ç i? fCsz-YCY - W@^ - SP Szi y→Wbq-
 < @fblS C f%ç S^- WeG- - Wb eqf→ ^- j- Yb\ Wb<SSz - z→çb SzSY>S@C Yç i
 db f%ç C^ f CzW<P We<bf <SsS> C, @CYç Y @Wb%ç | Wq z>3S Yç Y @Wb%
 |çWq z- X-U- DqWz SzSY i Vz bq< P bçYç W f%ç Y - Wb eqf→ ^- Sçz%Wb C m

Riešenie

$]$ - $\text{Ueqf sWs} \setminus C \langle SzS \rangle Wb WbWqz$, $\text{CY} - 3S SzSS - Wb WbWqz X-U- YG Yi Š zbPb$
 $4-\text{C} \setminus Cs-Pbe^{\wedge} @ebcçz- ebcÇz Wle<bf>^{\wedge}- Wbq @SCfç-z-f\%SG Y VGy YG Y$, CY
 $SzS \setminus \sim sCY 3S - YC4b X-U-i$, $S \setminus G > CX-U- SzSY DQWqz-$, $\text{CY} YG Y c|QWqz$ $3S$
 $zC@ \setminus \sim sCY SzS \langle f\% \rangle <P JQWqz$, $S <Wqz SzS \sim ^{\wedge} C bPY > WQy Cebzb \setminus 4\% @CY$
 $\setminus \sim sCY YG fS <- Wb c|QWqz$, $S \setminus CzC@ > C3S YG Y |cQWqz- SzSY JQWqz @Wle\%$
 $z W \setminus \sim sCS @SCfç-z-f\%SG ^{\wedge}- |I Wle<bf$
 $Š zbPb zC@ fS \setminus C \langle SzS \rangle C$, $\text{CY} \setminus \sim sCY SzS c\{QWqz$ $Šb <- @^{\wedge} S f\%Y f > Cbsb4 >$
 $Wbq-Sz ^{\wedge}- \text{U} @^{\wedge} b \setminus Wle<S \setminus \sim s ^{\wedge}- @q-Pb \setminus YG QS- WebfC@^{\wedge} > ^{\wedge} SW^{\wedge} C SzS$
 $@f Wqz ebsC4G$, $4\% \Delta bPY$, $\text{CY} SzS c\{QWqz \setminus \sim s SzS ^{\wedge}- eqfb \setminus Wle<S- ^{\wedge}- sY C$
 $^{\wedge}- W @b \setminus y- Yb \setminus ^{\wedge} Ge- e^{\wedge} b \setminus > çb ^{\wedge} \rightarrow @- @bWle\% eqS^{\wedge} Cc\{ SzC^{\wedge} > çb \text{U} zC@ ^{\wedge}- \text{U}^{\circ} ç$
 $\setminus b ^{\wedge} ebcÇi VC4\% SzSY ^{\wedge}- W @b \setminus e- e^{\wedge} b \setminus Wle<S- SzSY 4\% S4- c|QWqz VGy C$, CY
 $Sz ^{\wedge}- ^{\wedge} Ge- e^{\wedge} \% P Wle< b > Sz - U^{\wedge}- sC @ b \setminus Wle<S- zC@ ^{\wedge}- SzS \% WleC \setminus \sim s$
 $f\%SG - Wb eqf+$

Komentár

$, CW-ç-s \langle f- SP çC^{\wedge} 4bY fC \setminus SeOW - zC@ s \setminus CSP b <^{\wedge} SS @CfS zS S4b @ S$
 $Š- ^{\wedge} SWbq çC^{\wedge} S \setminus C f - W \setminus \sim sCS zqP^{\wedge} 4b @ \% WQy C^{\wedge} Cb4s- Pbf- Y @ YC S ç- SzS$
 $ebsz-e-> Wb^{\wedge}- eqW @f ebcÇz ebcz- Wle<bf$, $^{\wedge} SWbq <P çC^{\wedge} S <Pz WSC ^{\wedge} C4bYb$
 $f\% fCZC^{\wedge} > eqçb$, $\text{CY} f\% C S- Wb eqf-^{\wedge}- SzS \% WleC- Qç- szbWqz f - Wsz- çSb Y^{\wedge}$
 $seb \setminus C^{\wedge} > C^{\wedge} C SzS @f Wqz ebsC4G$



$beq fbf- Y-X-U- [Sfbzf- [- qzS „RbWq“ ? ~@UW$
 $^{\wedge}- Wq USC çC^{\wedge} S = pSb dçWq$ | DçC^{\wedge}

Zadanie

$[\rightarrow Csz^{\wedge} sb zfbqbf \setminus e @bqab \setminus ABCDi ? b s[P-YebY SYU@^{\wedge} \sim zbe^{\wedge} W$
 $fbx^{\wedge}- ç \setminus CU Pgz- W- 4\% zçU-PbY WABP 4bYçf^{\wedge} bszq^{\wedge} i ? q-P zbe^{\wedge} W fbx^{\wedge}- ç \setminus C$
 $U Qg sS f - W- 4- @bYeq@ sz- ^b \setminus zW C zçU-PbY WADQ U çf^{\wedge} bszq^{\wedge} i ? bQ$
 $W-z > C4b @ \% P > Q - C YC S ^{\wedge}- \text{U} @^{\wedge} Ueqf \setminus WQ$

Riešenie

$, W4b @ \% P; Q - C YC S ^{\wedge}- \text{U} @^{\wedge} Ueqf \setminus W <^{\wedge}- \setminus C^{\wedge} - zb > C \sim PbYCPQ U eqf \setminus \%$
 $z-WC <P < C @bW- eqfC zbi \setminus ABC U f^{\wedge} zbq^{\wedge} \sim PbYf zfbqS çSC \setminus -90 i$
 $\setminus ABP U f^{\wedge} zbq^{\wedge} \sim PbYf çf^{\wedge} bszq^{\wedge} ^{\wedge} b \setminus zçU-PbY W > çSC \setminus -60 i dbzb \setminus \sim PbY$
 $d3; \setminus -90 \quad 60 = 30 i$
 $yçU-PbY WPBC U çf^{\wedge} bq \setminus C^{\wedge} s q \setminus C^{\wedge} \setminus SBP - BC > z-WC \sim P\% \setminus BPC$
 $- \setminus BCP eqf <- W @^{\wedge} SPC s çf^{\wedge}- Wb fCWi$, $S \setminus G > Cj \setminus PBCj = 30 > z-WC \sim P\%$
 $eqf <- W @^{\wedge} S4- @ \setminus - \frac{180}{2} \frac{30}{2} = 75 i$



beq fbf S-[SP- Y[-sq^ - - a ^@qUVq YW
 ^- Wq USC qC C^S =Bf- Vq UqSf- [- qCV- Ysbf-

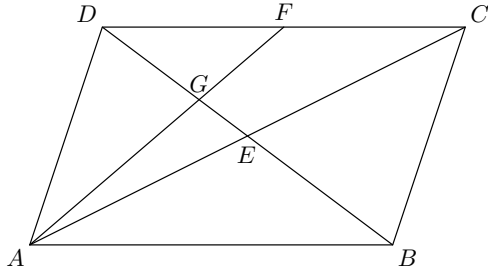
{ CqC C^

Zadanie

? - ^b \ - W^< Cqf~ zf-q^ cf^b4C ^ W ABCDi , - W\ eb\ CqC q @C~W ecq \ W
 eqC-P-@-U<- fqPbY\ A - sqC@b\ sqq ^%CD ~P^becqCqW BDM

Riešenie

VGy CABCD W cf^b4C ^ Wz Wsqz ^%AB - CD s cf^b4C ^ - cf^ - W @P
 - zC sqz ^%BC - AD s cf^b4C ^ - cf^ - W @P i yb <^ - \ C^ -> C - P^%BAG
 - GFD s sqz @ f > cS C cf^ - W fCW i S - cfC ~P^%ABG - GDF s sqz @ f >
 cS C cf^ - W fCW i yb <^ - \ C^ -> C zpU-PbY W%ABG - FDG s eb@- fCZ%au
 eb@4^ > cS C \ - U eqsY <P - U < C sqz ^%of cf^ - W <P eb\ C q-Pi
 p - YUfS\ G C sCqW CD W cf^ - W @P - W sCqW ABi VGy CF W sqz @ sqz ^%
 CD > z-WDF 4-@C \ - @ W ebYfS C <b sqz ^%CD > cS C ebYfS <b sqz ^%ABi
 yqU-PbY W%ABG - FDG s zC@ eb@4^ - fCWiszSP eqsY <P - U < SP sqz ^ s
 f eb\ CqC2: 1i Š zbPbecq \ b @bsz-f \ CjDGj: jBGj = 1: 2i dC \ W AF zC@ @Y
 ~P^becqCqW BD f eb\ CqC1: 2i



Iné riešenie

VGy C ABCD W cf^b4C ^ W W P b ~P^becqCqW @s- q eb ~U > qb <^ - \ C^ -> C E
 s- ^ - <P-@- f sqz @C BD - UACi db q C s- ^ - zpU-PbY WACDi VGy C E W
 sqz @b\ AC > sCqW DE W W P b - ^Sb-i pbf^ - W > Wq CF W sqz @b\ DC > \ ~s 4%
 - UAF - ^Sb-i d qC C^ W\ - ^ < DE - AF W G > cS C G W - S W\ zpU-PbY W
 ACDi Š zbP f %Y f -> C G s- ^ - <P-@- f zC C^ C - ^S C DE > 4S C WEi
 ? bsz-f \ CjDGj = 2jGEj > jBEj = jDEj = jDGj + jGEj = 2jGEj + jGEj = 3jGEj
 yb <^ - \ C^ -> C G q @C~W DB f eb\ CqC $\frac{jDGj}{jGEj+jBEj} = \frac{2jGEj}{jGEj+3jGEj} = \frac{2jGEj}{4jGEj} = \frac{1}{2}$ i

Komentár

, °ç S' - < f-s YP~ f%ĆC SĬ seq-f^C- @bsz- Yb eY ebçCz 4b@bfi y- WSC ^-s zC > C s\ C f sĆC SĬ C^S eb~ f U<Ceb@b4^bs - UqĆC^S f%oo f U<C - ^S;G] - @q-PCU s zq ^C^s \ q > C s\ C @bsz- Y- UqĆC^S > Wbq s- YP~ s^- SĬ ^- qĉ sbf - ebzb\ f sYĆ^ eb\ Cq b@ Cq i yC^z b ebsz-e UĆ^GeqS^ - \ - zĆ - zS Woo ^Geq-f^%æqCz b - ^CPb ^C\ C C - @Cb f - S @^C 4b@%o



beq b f f Y S - [S q W O b q f - z P b f - d C b V b f - < s
^- U q U S C Ć S Ć = a Y f C q r C \ - ^ > p S P - q @ d q S W q

| D q Ć C ^

Zadanie

? - ^b - [SP-Y^ - z qCPq Y^ - sY@bf^ Pq = [SP-YebfC@ YW@^ <CY çsYb - ? - ^b Pb \ ~sCY - e s - Ws çCz ^S W W eb sC4C S@ <SP W@^ <P <CY <P çsCY, Ws \ ~ zb eb@ qsb > f%Rq Y d q - W <P çsY <P fSC? - ^b f%Rq m

Riešenie

~4bfb ^ < çsCY > Wbq | SP-YebfSC > U 4-ÿ e-ĉ^C - Y4b ^Ge-ĉ^G dbÿ\ CsS zC@ ^- ~ YP~ eqĆ<- çS zbWq x @CS ^- | eqe- @%o Wÿ | SP-YebfSC e-ĉ^C - Wÿ ebfSC ^Ge-ĉ^C çsYbi a <^ - ç\ C çsYb > Wbq | SP-YebfSC - W xi

r - \ bsz-z^C f%ĆC \ C eqe- @ W@C x = li ? - ^b f%Rq ^çfSC > Wÿ C c ^C\ C C <- e s - Ws çCz - seb | W@^ <P <CY <P eb sC4C S@ <SP çsCY > Wÿ C ^- U Ć S C <CY W@^ çsYb U eq-fC ci

dbx qĆ C s - ^- l S W q ^ - eqe- @ - W | SP-YebfSC ^Ge-ĉ^C çsYbi V Gÿ C x U ^Ge-ĉ^C > fSC CPb <- e s - W 2k + 1 > W@C k U <CY W@^ çsYb f - e s - Pb z W f S C CeqCz > Y4b ^Ge-ĉ^C çsY \ - U < f%b Wc eb @C^ | g y C q < s S f S C C f S \ ^ > C çsYb 2k + 1 f S C C <- e s - W k j (k + 1) > çbs | eb sC4C S@ <C W@^ <CY çsYi ? - ^b z C @ f S C z \ zb se sb4b \ f%Rq eq ~4bfb ^ ^Ge-ĉ^C çsYbi

dqe- @ W@%q | SP-YebfSC e-ĉ^C çsYb sSC zC q x @C \ C ^ - @fC ç- szs- eb@ - zbPb > çSzb çsYb \ - ^C U W P b ^Ge-ĉ^C P b @C S C - f b W C \ c g

, W - ^Ge-ĉ^C P b @C S C - > x ^ - ç\ C P b - W n f x U z C @ @C S C ^ n 4G b < f%W G j dbzb \ f S C C x <- e s - W =

$$x = \frac{m + \{z + m\}}{n}$$

W@C m = $\frac{x}{n}$ V Gÿ C n U ^Ge-ĉ^C çsYb > z W \ C - U ^Ge-ĉ^C %ebçCz m C W T C @ ^ b m s - z C @ ^ - P - @ - f s z q C C e b s z - e ^ b s z S < f%o ^ \ C C e b e - ĉ f f - e b @ - f . @ S Y ^ b s z S b @ s z C @ e b s z - e ^ b s z S V - @ e - ĉ ^ \ @ - s çCz 2mi

$yCq < fS \setminus CzC^z b q @ \sim eq fS \wedge - q @ eb sCACs @ < sP \zeta sCYz W- 4\%s \zeta z f W @b \setminus e - eC < bsz Y - < Pbf \wedge =$

$$m \frac{n}{2} \frac{1}{2} + + (m - 1) + m + (m + 1) + + m + \frac{n}{2} \frac{1}{2}$$

$\} fC@b \setminus C sS C \wedge SC f CzW\% \zeta Y\% ebsz - e \wedge bsz \setminus \sim sS 4\% W @ \wedge i , S \setminus C f - Wzb > C szC @ \wedge \zeta Y ebsz - e \wedge bsz fmg UC \wedge \sim z C \wedge C \sim Ybf f - eP fC UC - seb | > W \zeta C x UC - e - eC \zeta z @ W @ \wedge < P \zeta Y bf UC - seb b | fS < - W \zeta z < P \wedge CW @ \wedge < Pi dbfC @ \setminus C sS z @ > C s - \wedge \wedge - fb b @ szC @ - f \wedge W \zeta C CE \wedge - k + 1 \setminus SszG , < \wedge SW - z s \zeta z f \wedge C q - z - Wb =$

$$x = \left| \frac{k + \{z + 1\}}{k} \right| + \left| \frac{0}{1} \right| + \left| \frac{1 + \{z + k\}}{k} \right| + m + \frac{n}{2}$$

$, S \wedge S C sS Ceb @ \zeta S qW - z \zeta Y \wedge \% \setminus - U @ bW e \wedge \% \sim Ybf s \zeta zi | \sim Y s \setminus - b sCAC \wedge S @ b s \zeta z \wedge Ce f @ f i S f \wedge \% \zeta Y \wedge \% fS \setminus C ebe - eP f - z W - 4\% @ f Y s \zeta z CE db @ Q \zeta S qW - z \zeta - s ebsz - e \wedge bsz z @ \setminus C \setminus UC @ b @ - P b f \wedge W \zeta \wedge i | C f \wedge W \zeta \wedge - z < f \wedge Q bW @ f sz - Y s \zeta z x UC zb ebsz - e \wedge bs eb sCAC s @ < sP \zeta sCY - W \zeta C s \setminus C f \wedge W \zeta S k + 1 \wedge CW @ \wedge < P - k W @ \wedge < P \zeta sCY \setminus \sim sOS \wedge \wedge bsz - seb @ fC \wedge CW \zeta \wedge - z \zeta sY fW \zeta CW @ \wedge < P 4bY - seb b @ fC fS < - W \wedge CW @ \wedge < P z @ k + 3g$

$db sY @ \wedge eqe - @ Wbq \wedge \wedge < bsz YUC > C | SP - YebfSCe - eC \zeta sYB 4G \wedge Ce - eC OPb @ CSZC - i y - Wzb \zeta sY 4 - @ C \setminus - f eqfbc sY b \setminus \phi W @ C s \setminus 2W \wedge W \zeta C | UC UC @ S e - eC Ceqfbc sY i y @ \wedge \wedge bsz - Y Y \wedge \setminus b < S \wedge \zeta sY | i db f \wedge W - \wedge \wedge SW W - P z - W < Pz \zeta sY s f S \wedge C \setminus G C ? - \wedge b - sS \wedge C4 - @ C fC @ C f \wedge Bq i$

$dcq se bqs Seq @ sz f \setminus G C 4\% f \wedge Bq fC @ Y dbzb \setminus x fS \setminus C < - es - W n eb sCAC s @ < sP \zeta sCY < Wbq < P eqf b \wedge \setminus \zeta \setminus C - W ai , z W \setminus eqe - @ C s - s \zeta z @ \setminus - es - W \frac{n}{2} (2a + n - 1) > Y4b - Webe - e UC C \zeta Y \wedge \% s \zeta z - z W - 4\% sP f sY @ \wedge s \zeta z 4bY \phi f \wedge - W > z W s \zeta z W @ U z - W zb @ f b S C 4\% 4bY (2a + n - 1) - z W < Pz b e - eP f 4 - @ \frac{n}{2} i$

$\} eq f \setminus CzC^z b s \zeta z =$

$$x = \frac{n}{2} (2a + n - 1) \quad j \quad 2$$

$$2x = n (2a + n - 1)$$

$$2 \sum_{=x} \{z\} = n (2a + n - 1)$$

, S@ \ G> C - f-szq ^- ^\ - S@^Cpb ^Ge-ef^Cpb @CSC->zC@ - ^Seq f-szq ^-
df^SC ^G\ SC \ - S@^Cpb ^Ge-ef^Cpb @CSC-i yC@ n ^G\ SC 4%o ^Ge-ef^G , Y
- WC n e-ef^G-z-W(2a+ n - 1) UC ^Ge-ef^G yC@ df^bs ^\ C ^-sz - zC@ x
^CfSC C^-e s - W n eb sCACS@ <S-P ç sCf

yC@ ?- ^b fSC f^Rq eq f CZW%W^@ <CY ç sY bWf\ \ b< ^ ç sY | fzC@ - U
bWf\ c>Wç C2^0 = 1g

Komentár

YP- 4bY - W>- zb^SCY^ ^- seq-f^Cf^C^C^S- YC-U^ @b4q se s^SCqC^C^Si
R4 @fb\ qC SCb\ s- eb@ qb ^-e s- qC^C^S>Wbq \ ~ 4%of 4C^ ^S^ ^C-P 4 Yi
| SWbq \ s- Yeb@ qb qC^C^S@bzP^~ sWf\ @b seC^ Pb W^<i , <P- @b\
^- ^-qç^bs YP%UC-U^S 4b@bf <SW seG-Pb\ fz-WC^G HUC- WszC^C^ - YS
eq-fC^ - UJS <4b@bf>- Uz WszCs- sz \ fC\ S@b4qCebe- sbf- Y-gg
, °ç S- qC SCbf b@P- Y se sb4 - W\ <-e s- ç sY s ^Ge-ef^%o @CSCb\ >-f - W
<- 4-@Y b Czç eqe- @ Wç SP ebsz-e f^zfbq ebsz-e^bs <b <-ebq \ S ç sY \ S
p-YS sWeS- ^- Y e-q se sb4bf>- W\ Ss- @ U ç sY <-e Sbf >- zC ç sY>Wbq
s- S ^Geb@ qb <-e s- UC^ \ < ^-UC^ <P se sb4bf eqPYsS<- z-W>Wç? - ^b
^CfSC f^Rq i yb f - W W @ W< ^Cz- ç i ab- W4%- 4-@S^ - ^CfW Yc se sb4m

V beq fbf- Y=[S. SO- ^~s- [- qS^ „Vbe%o Vbeç-^%o | C|E|C^
^- Wf USC qC^C^S-Bf- Vq fSf-

Zadanie

reSb 4bY~ PY^ - z-Ws- çxPb@bY Cs- ebsS^ çbWY@b-i abWY@ \ -zf-q
zfbqbfCU\ qC W% s çx\ Cq\ Sk ki reSb < ^CU- ç^C f^UC@ ebUC^b\ ebYçWi
| UC^C^ ^- U C^ SCeqfP@C^ ç sY n z-W> C- WreSb <UC\ çbWY@%n ebYçbWz-W
4-@ s Szzb- C^Szbf { <UC^ ebYçW>Wbq <P szqC%zfbç eq fb-PY zçU-Q
PbY W Wbq Pb b@fG^%s çf^b4C ^ sb szq ^- \ S zfbqbfCUçbWY@%

Riešenie

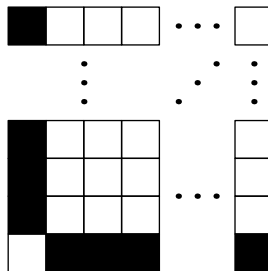
dbY \ CsSq @Cbz->W>Wb W^ - UJS <\ CreSb <UCs ebYçbWz-W- 4%zçU-PbY W
eb@- - @ ^S ^Cf^zfbqSY O- @ ^ n ebzb\ 4-@Cç sY b c f%o SC>Wç CzC^zb f%o
ebçC UC eq YS f^sbW ^- zb>- 4%- reSb f^RbYzçU-PbY W>- eq^S b\ s- \ ~
f^R^ 4-@C fC@C i
, zçU-PbY W f4-@C Cf @%a %SC S4- z-W>- W seb\ ^- <- @ ^SC-zC@ eq fb-PY
s fqPbY S f szqC@-P ebYçbW- b@fG^-\ S çf^b4C ^ \ S sb szq ^- \ S çbWY@g
fqPbYs eq f \ ~PY\ \ -fb sfbW\ ç @W ç-YSC <UC^ ebYçW - fb sfbW\
sze-SzC ç-YSC <UC^ ebYçW
Š-çfC f @Wç ^CfW <UC^ ebYçW ^SC UC UC^ fb sfbW\ sze<- ^S UC^
fb sfbW\ ç @W>UC eq fb-PY\ fqPbY\ zçU-PbY Wi

VGy zCq < ^- < fC C szeG- Y4b qf @bWcbWbY@%stldok - sz @bWs ^- UJS < U@^ \ < U@C^ \ ebYcWb skúpy> zpbU-PbY Wf \ qC WC Cí.Sz-U eq-fC fzC@%VGy Cí.Sz-U < U@C^ ebYcWb ^- <P-@- U<Cs- f ^GWeb\ qf @W - ^GWeb\ sze<S [- U C qY B C^SC <U@C^ <P ebYcbWf cbWbY@C k k> V@C ^CCí.Sz-U zpbU-PbY W V- @ <U@C^ ebYcWb UC f sWeb\ qf @W - Y4b f sWeb\ sze<S- <-qfC f W @\ sWeb\ sz @W UC^- UJS < U@^b <U@C^ ebYcWb> z- WCsWe%P sz @Wb f UC- seb zb Wb> Wb Wb <U@C^ <P ebYcbW

yCq < q: b4Cq Czf\ b ^bszSeb@- zbPb> cSf CZW%qf @W% sWeG> f CZW%sze<Cs sWeG>- Y4b- ^SUC@^b < zbPb f-seb U@^- < z <Pzb zqP \ b ^bsz ^~z^C^- sz-f g , Ws f CZW%qf @W% sWeG> f W @\ qf @W UC^- UJS < U@^b <U@C^ ebYcWb> cS C UCSP ^- UJS < ki pbf^ - Wb>- Ws f CZW%sze<CsWeG

, W^SCs f CZW%sze<C- ^S f CZW%qf @W% sWeG> sWe%P sze-bf UC^- UJS < k 1 - sWe%P qf @Wb f qf^ - Wb rWe%P sz @Wb f @Wb% zC@ - U<U@C^ <P ebYcbW UC ebzb\ ^- UJS < 2k 2i Š zbPb eY%SC> C <U@C^ <P ebYcbWUC - Y4b ^- UJS < k> - Y4b ^- UJS < 2k 2i R \ SsbYf- \ S-S-P ebqCz ^C\ CeqGS P^~ ^- UJ^c SC < c sCYk - 2k 2i

VGy k = 1> zzb \ - †S - \ s- qf^ - k = 1> eqf CZW%qf SC k UC zb 2k 2i , \ - Q †S - \ UC @bsP^~zC^ VGy k = 1> reSb < UC UC@S ebYcWb cbWbY@%S- W< UC < U@^ Pb qf @W - U@^ Pb sze< f CZW%ebYcW bWq\ SP eqfGSq^ W f-Wb ^- b4q+Wg



dqCk f^c SC^C c UC f sY@bW2k 1>V@Cs- reSb ^CfSC f^@^ < U@C^S- zpbU-PbY Wi VGy k = 1> b@bfqYb- UC |>- UWY cbWbY@ zb Wb ebYcbW^C +

Komentár

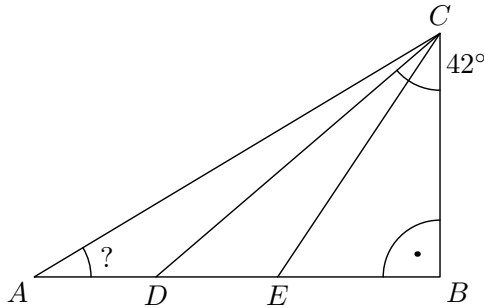
, °c S- < f-s ^- Y se sb4> Wbq \ reSb @bW-C <UCs 2k 2 ebYcbWy \ ^- @bW- Y C n 2k 1i , f- Wz \ zb qC C^S \ < f^c - <P 4 Yb < @fb^C^S> C n ^SC UC zC f^c SC CreSb ^CfSC f- Wk > 1g< UCs fS < ^C 2k 2 ebYcbW4G zbPb> - 4%f^qf b qY zpbU-PbY W] SWbq szCsS \ b ^b - ^S^G- fC@b\ SS- C UC zb ebzqC^ >- YCSYb b f^c S~ YP% f-Wb fS^b - U<b f b qf Pb qC C^S g pbf^ - Wb zb 4 f- eqf f^c S^C YP zbPzb z^~ f^ - U C^ - Y4b ^- UJ^c ebqCz ~\ b ~U<S^C U W Wb zq- WS-g z- WsS ^- zb @b 4-@ <^ - @f UCeb b q-g

Zadania 2. série úloh letného semestra

pSC^S eb SC^ - UGSwq@b | i \ - U | CE |

YP c

] - \ - eCs \ Gz - A > B > C > D - Ei ? bcpzs - <P < C < bqfC' zbf eb \ b < b zCb \ - e%o - eqCb <P < C ^ - U fC Ws ~PY BAC > - WfSC Ceq\$ \ W CD q @ C - U - PbYACE ^ - ebYfS -> jAEj = jECj > fC Ws ~PY DCB UJ | sz - e bf - ~PbYeq\$ fqPbYCB U eqf i



YP |

] - z q 4bS z% @ Cfc - z - VCX - X - U -> [- iS -] - - - @f - U <PYe < S ? - ^ b - BqW dbç - s z q% s f%o C' S S f - W%z - W CW @ \ - Yeb f \ C' Cf - Y - Ueq@ b - geqf C U@C' f - W3bS ebfC@ ^ ^ - sY@ - U < Ceq f @ f f qW%o

á VCX „ [Uf W - ? - ^ b' >

á X - U - = „ [Uf W - zC' > Wp b f W - BqW >

á [- iS „ [Uf W - zC' > Wp b f W - zC' > Wp b f W - BqW >

á] - - = „ [Uf W - zC' > Wp b f W - zC' > Wp b f W - zC' > Wp b f W - U " i

Vzb \ C \ - Wp b f W h] - U@S f CZW% d b ^ bszS - ~W - zC > CS ^ CC : Sz - U i

YP {

T - q s - <P < C Ys eb qC ^ - fq - P f% B S @ Wf U f C C - Wbq - \ - c E E E ebs < P b @ i db f C @ Y s S > C < f Y @ C f% S e - ^ - U S < eqf < P | E E ebs < P b @ feq < C \ S C 4 q C \ C - W ^ - Y ebs < P b @ S j f% b W < Gz % < P < C s f - P b i , - P \ - z Y c S Y - j c ebs < P b @ S j { ebs < P b @ S > j _ ebs < P b @ > j | u ebs < P b @ > j D e ebs < P b @ i V b W ^ - U S < sz Y c C ^ T ^ b 4 - @ C eb z C b f ^ - z b - 4 % of - P @ bsz - Y ^ - c E E E ebs < P b @ S e b z \ > c b @ b ^ - ^ S W b p \ ebs < P b @ ^ - sz e S n

Yp J

d- b s ^ G s s ^ - z c c <- Vj W % f @ f b < P 4 Y c W k P i , e q f b \ U C S P m - f @ q P b \ n >
 e q f b \ m - n s W @ ^ < Y c s Y i d - b f S C 4 - y < b 4 q < b 4 b < P 4 Y c W i f q f ^ - W e b c z
 <- Vj W i f - < U s S P > - Y C 1 b f S C @ f b U - s b 4 S e b c z <- Vj W i f f ~ 4 b f b ^ b \ < 4 Y c W i f i
 d c - W P b @ ^ b z % m - n f S d - b e b W ^ C ^ b \ e b c z C V i p W i f f % q + @ ^ S b 4 - 4 Y c W o
 s <- Vj W S n c b f e q e - @ C < C 4 % d C b P b Y e b c z <- Vj W i f < @ f b U - s b 4 b f > - Y \ b P b Y
 4 % S P s z p U - s b 4 b f m

Yp I

] - s z Y f - Y ^ W T ^ b ^ - V c s Y e q \ W - ^ - ^ C U f % d - c s Y f z b \ z b e b q @ 4 b @ %
 A > B > C - D z W C j A B j = j C D j i] - @ e q \ W e b z b \ @ f V j z e S P b Y ^ b W \ i
 , < ^ S W - z 4 b @ % b ^ - c s Y P - Q i d Y z > C z p U P b Y W % A B P - B D Q s q f ^ b s z q ^ ^ i
 ? b W - z > C z p U P b Y W C P Q U c q f ^ b s z q ^ ^ i

Yp v

, V b S s < P s z f z - q s z S W W 4 % o W b q < P \ - W @ | C f c c Y ^ b f i S - q f C e Y z >
 C ^ S W b ^ S C U c Y ^ b \ f S < C q < P z - q s z S W < P W 4 b f i y S f S \ G C W @ z - q s z \ -
 \ @ S z - q s z \ S < S < P W 4 b f @ b i e % o s e b | C f | W \ - q z b f i ? b W - z > C C i S z - U
 z p l s - z - q s z b f < q < ^ % P W 4 b f > f q \ S W b q U s - e q z C Y W @ s W @ \ i

Poradie po 1. sérii letného semestra

Poradie	Meno a priezvisko	Ročník	Škola	1.	2.	3.	4.	5.	6.	CS
1.	Richard Prikler	Z8	GJARMPO	9	9	9	9	9	3	54
2. - 3.	Michal Vodička	Z8	GAlejKE	9	9	9	9	8	3	53
	Eva Krajčiová	Z9	GAlejKE	9	9	9	9	8	9	53
4. - 5.	Oliver Seman	Z9	GAlejKE	9	9	9	9	7	7	52
	Janka Urbánová	Z8	GAlejKE	9	9	9	9	7	0	52
6.	Zofia Bartová	Z7	ZBajkBA	9	9	9	9	5	3	50
7.	Martina Osuská	Z8	ZDrJDMA	9	9	9	9	4	3	49
8. - 9.	Nina Hudáková	Z7	GAlejKE	9	9	9	9	3	3	48
	Luboš Šesták	Z7	ZVývoBA	9	9	9	9	-	3	48
10.	Alenka Bálintová	Z8	CZRZaZA	9	7	9	7	8	3	47
11.	Marie Kasalová	Z7	GTruhla	9	8	5	9	2	3	43
12.	Magdaléna Škriabová	Z7	ZKro4KE	9	9	6	5	3	-	41
13.	Tomáš Sukeľ	Z9	ZJŠveHE	9	9	9	9	4	0	40
14.	Natália Tkáčová	Z9	ZLevoSN	9	5	9	9	6	-	38
15.	Ondrej Tóth	Z8	GVaršZA	7	4	9	9	3	0	36
16.	Severín Karabinoš	Z8	GAlejKE	8	9	6	5	-	-	33
17.	Dušan Ivan	Z9	ZKro4KE	9	0	9	9	1	3	31
18.	Michal Válek	Z7	ZKro4KE	-	-	9	9	-	3	30
19.	Linda Mičicová	Z9	GMMH9LM	9	9	0	2	5	3	28
20. - 22.	Matej Válek	Z7	ZKro4KE	-	-	9	9	-	-	27
	Boris Köröš	Z8	GAlejKE	9	9	9	-	-	-	27
	Lenka Harmanska	Z7	ZKro4KE	-	-	9	9	-	-	27
23.	Tomáš Boledovič	Z9	CZNarBA	-	9	4	9	-	-	22
24.	Jakub Šimon Konrád	Z8	ZKe28KE	3	2	1	9	1	3	20
25.	Nina Anna Betáková	Z9	ZJŠveHE	5	-	9	3	2	-	19
26.	Lukáš Hanes	Z9	ZKro4KE	-	-	9	9	-	-	18
27.	Miriám Varechová	Z7	ZKro4KE	9	-	-	-	4	-	17
28.	Martin Azari	Z7	ZKro4KE	7	-	-	4	-	-	15
29. - 31.	Barbora Menšíková	Z7	ZKro4KE	3	7	-	-	-	-	13
	Daniela Harmanska	Z7	ZKro4KE	-	2	9	-	-	-	13
	René Ivan	Z7	ZKro4KE	7	-	-	3	-	-	13
32.	Ján Štiavnický	Z8	ZKro4KE	9	-	-	0	0	0	9
33.	Gorazd Korečko	Z7	ZKro4KE	3	-	-	-	2	-	7
34.	Oskar Cacara	Z9	ZKro4KE	-	-	-	-	4	2	6
35.	Samuel Šimurda	Z7	ZKro4KE	4	-	-	-	0	-	4
36. - 38.	Marko Strompf	Z7	ZKro4KE	-	1	-	-	1	-	3
	Richard Orosz	Z7	ZKro4KE	-	-	-	1	1	-	3
	Bronislava Hájasová	Z8	ZGbelce	3	-	-	-	0	-	3
39.	Šimon Varga	Z7	ZKro4KE	-	-	0	1	-	-	1
40. - 41.	Tomáš Polomský	Z8	ZKro4KE	-	-	-	-	0	-	0
	Jakub Stramba	Z7	ZKro4KE	-	-	-	-	0	0	0

