

KOREŠPONDENČNÝ MATEMATICKÝ SEMINÁR

MATIK

Číslo 5 – Ročník 37

matik.strom.sk



Ahoj!

yfbU ~ ebP - @ < U f ^ C ^ C ^ S W y - Y S C f % @ ^ S C M A T I K - > f W b q \ ^ - U @ C ^ S O C ^
ebq @ C e b e q f C U s q S z b P z b s C S z q > - Y C - U ^ - C f : b q f q C C ^ S i] G - 4 @ U f - W
C s \ C C z C Y ^ f e b Y - s C - z - W - q S C ^ C e b - f - U - e - s z S - @ b @ q - P C U s q G r q @ b s b -
b C - W f \ C y f b U C y - Y S C q C C ^ S F

f C @ < S M A T I K -

Ako bude

Minisústredenia na školách

] S W b q < - S W f - f : @ C Y f < C - W S f S % W b q q b 4 \ C > 4 % s \ C q @ S e q 4 Y S S - U s W Q
e S C S W f > W b q ^ C q C S ^ - C s C S - e C f e b @ b 4 C W j - z W P b \ - z C - z S W P b s s z q C Q
@ C S e q \ b f W b i , s e b Y - e q < S s b W b Y \ S b q \ ^ S ~ U C C U @ b @ b f - @ f b l @ b f
\ - z C - z S W , \ S S s z q @ C ^ S " e q { C E v C E S W f I i _ i q C ^ W f f @ % q s - P ^ - U
f S < J q C ^ W f g r s z q @ C ^ S e q 4 S P - U e q \ b f e q C z b q < P W b % S < s - @ b f S z C
^ - P z e s = w w \ - z S W s z q b \ i s W s W W W z S f S z % w \ S ^ S s - s z q C @ C ^ S - w i

Tábor mladých matematikov

? q P q C S z C - W e q C \ - > c b s q - s b \ e b c - s Y z ^ < P e q < @ S > \ - > C e q z C -
@ b 4 q s e q f % b } f S \ C > W @ % W C s - 4 - @ C W ^ - y [[> z C @ y - 4 b q \ Y @ < P
\ - z C - z S W f F , W Y C @ - e s S q C q j - U \ _ i U Y - I i - ~ L - s z | C E j > e q C z b C e q f C
f z C @ % s - b < S ^ C C f p C W C q ^ b \ s z q @ S W S C C ^ 4 q P ^ - ^ - U - s ^ C U C U - W S q W i
d b f - ^ W s b @ W < b \ ^ - e q P Y s b f - ^ S ^ - U @ C ^ - s z q - W i
] C f S > c b U C y [[m y - 4 b q \ Y @ < P \ - z C - z S W f U C - W s s z q @ C ^ S - f - W C @ P S C >
z - W C b z b W Y e S F , S < S H i q \ - S - - U s - \ b z ^ e b f - ^ W - e q P Y s b f - ^ S ^ - U @ C
^ - P z e s = w w \ - z S W s z q b \ i s W z \ \ w i

Máš Problém?!

p - Y q C ^ W e b e - Y e ^ C u b ^ S ^ C s z - C [- e q b 4 Y \ n f s - z C ^ z b W j z - s W z b c ^ f e S z b W
{ i \ - U | C E J i r - U C ~ q C ^ - e q \ - e ^ C e q C S W f J i - _ i q C ^ W S - e q s Y ^ < P
q C ^ W f a K > ^ b < - e b S s \ ~ S S W f ^ \ Y @ S < S
d q C s - S < S P s \ C s ~ z q @ S ^ C e q e q f S S s - @ < - ~ U - f < P \ - z C - z S W < P e q b 4 Q
Y \ b f - Y P > ^ - q C C ^ S W b q < P \ - U v C E \ S ^ z i , W s - e Y ^ - U C z q L S z q b f - > ^ C Q
< - 4 - @ ^ S C ^ - s Y @ C e b z f q S f - ~ q L S z q < S f C Q - S S - W b q f - > 4 - @ C < - s Y ^ @ b
f \ S - f C @ C U - f C @ C U s z q ^ W %
, S < S H i q \ - S b s \ b z ^ U s - S - W - U q L S z q < S ^ - U @ C ^ -
P z e s = w w \ - s e q b 4 Y C i s z q b \ i s W i

Vzorové riešenia 1. série úloh letného semestra



beq fbf-Ÿ=[- qŸS „ Vbe%o Vbeç-^%o pS b d qŸWq

JD qŸC^

^- Wq USC qŸC^S=[- L@ Y^- VŸ 4bf->[- qŸCV-Ÿsbf-

Zadanie

Š f q ^ ^ C^ ç szS<- @ ^ S 4bŸ~eqŸS^C^ |Ii|i|CEJ
 , qŸC S- 3bcçs f%o%CS Pq s WŸ@^ \ S<CY\ SçsY\ Sb@1 @b ni , PçS- szçŸC
 @ U f -Pb<P>- zbz-W C f W @b\ -P- sSPqçç b4CqŸC@^b< CzC^Cf%4qz <P
 çsŸY, qŸC S>Wbq<-ç ^->f%Ÿq->- W4~@C\ - ^- Wj^<SeqŸsC4C@fCçsY>Wbq <P
 s çS ŸC n+ 1>S- Wf%Ÿq-3bcçsi Vz bq Pqçç \ -f%Ÿq-f U<- szqz LS-mf, %Ÿq-f Q
 U<- szqz LS ŸC ebsz-e>eb@- Wbq Pb Pqçç f%Ÿq-4C bP-@ ^- -P%š eCq ig

Riešenie

? bW-\ C sS C f Pçq^ szqz LS 4-@C\ - 3bcçsi , WsS, qŸC S f ^S Wbç\
 <b sfbŸSP -Pbf f%4CqŸC ^Cj WPb @ŸC- çsY n+ 1 fb ^-ç\ C sSPb - Wj xg 3bq
 ççs f ^-sY@-U <b\ -P- f%4CqŸC çsYb (n+ 1)/x - <-4q^Szb\ ~>-4%šSzbz çsYb
 f ^Cj Wb\ ^Cj Wbq b\ -P- \ bPY f%4q , qŸC S>ç\ 4%@bsz-Y @fbŸ~ çsYx
 - (n+ 1)/x> Wbq @-f U s çS^ n+ 1i y- W4%of%Ÿq Y>çb 3bcçs ^C-P<G , %oŸC
 seb\ ^-^b- szqz LS- s 3bcçfŸSeb@ q <-4q^S , qŸC S>-4%@bW- Y f%ofbçŸ
 Pb-SjW @fbŸ~ çsY>Wbq @-f U s çS^ n+ 1>eqçz 3bcçs f %of%Ÿq+



beq fbf-Ÿ=T- ^W } q4^bf- [- z [- sq^-

Ju qŸC^

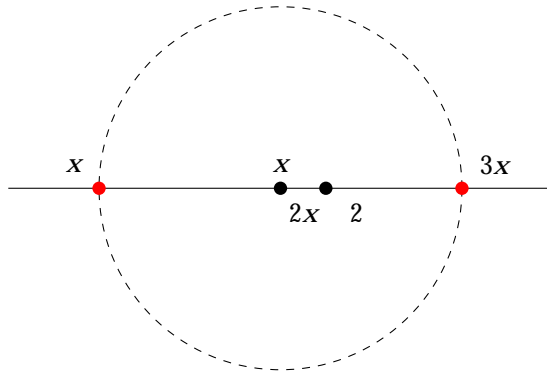
^- Wq USC qŸC^S=? - ^ŸY y Wçbf->, Ÿ- G Y@çbf-

Zadanie

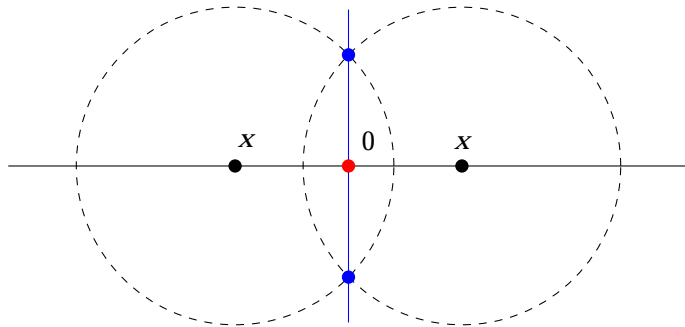
, z ^- <bsYŸ d%LbçfŸS ŸP~.,] - çsYŸCubsSs <-<^ -çC^ 4b@%α; 2x 2 - 3x
 f fŸCz>Wbq 4b@eqŸY <P- Wbq \ ~ çsYçj] -ŸS 4b@%ŸE ci“ , Wj zb \ bPbYd%Q
 Lbq s seq fS>Wçy \ bPbYeb- S S4- Wç Sçb- eq f zWj 4G \ SçqWan

Riešenie

r eq f zWb\ 4G \ SçqW%çŸŸC\ Cç eqŸS^ fç@S Y^bszŸ , f- Ws eb\ b<b- Wç-Q
 SçY \ C C., ^-4q “ fç@S Y^bs \ C@S@fb\ - 4b@ S Wbq <P fç-Ÿ\ ^ ebŸP~
 eb^→ G- ^-^Ss U ^- S \ Sçzb ^- çsYŸCubsS] -eq WŸ@- W Wç Sçb <-eSPQ
 ^C C@b 4b@ x- ççzS P^C CPbeqŸS^Ceb 4b@3x>\ C C^ \ ^- WçŸŸ f ~4bq
 fb^b\ 4b@C Wç ^S~ sebY\ Cç\ j3x xj = j2xj f- 4sbYz^ - Pb@^bz- ŸCebzçA^→
 Wçy Cx \ C4%o<-ebç çj , S ^S C sS C- Wz- Wzb Wç ^S~ ^- WçŸY C f 4b@C
 x>z- Wççz^CçsY bs eq f C f @fb<P 4b@b<P=x+ 2x= 3x - x 2x = xi



$x > z$ $WfS \setminus C \sim qS$ - UebYP~ 4b@0>WQy C0 \ \sim s
 $Y C$ - eqS^C~eqpszf@ \ C@Sx - xi rzc@ sCqW%o~qC^CU@fb \ - 4b@ S<bszcpU \ C
 eb \ b<b~ Wj~ S@Y - eq f zW 4G \ SCqW%o^sYCb f^G=eb \ b<b~ Wj~ S@Y ^-\ CqS \ C
 b ^SCb fS < - Wb UC fb@P~ @bf ^~g ebYfS~ @ W%o sCqW%oVq~ S@Y s zb-zb @ Wb
 <-eSP^C \ C@b eqf Pb Wj^< sCqW%o be \ C C Wj^ ^Sbf b4YWr z \ Sz \ ebQ
 Y \ Cq \ be \ C C y-Y b4Y Wk @q-P Pb Wj^<i a 4Y W%o~ ^\ \ ~sS eq- f |
 4b@<Pi | ~sY@^Cs eb \ b<b~ eq f zW zSz b 4b@%sebU \ C- ^~L@C CeqSCq^ W CQ
 @SSP sebU S b~ - @ ^b~ sCqWb~i Sb s%o CzqC f sY@^ Pb b4q~W UC \ U f^ > CzC^ zb
 eqSCq^ W ~s 4%oszf@b \ ^- CU sCqW%o



$T@S^$ eqe-@ W@%zC^zb ebsz-e P-@ ^S 0 ^C \ C \ C eb~ S>^~sz ^G~ W4b@%
 $x - 3x$ $Y C S$ ^- cpf^~ Wb \ \ SszC>zC@ Wj^ ^S~ < 4b@ x 4%4bY <@LC^Cpf- ^~
 s ebY \ Cq \ 0i , z- Wb \ eqe-@ C f - W \ ~s eYzS $x = 3x >$ < cpPb f%Y f- $x = 0 >$
 $z - WC 4b@0 4%4bYUC@b@~Pb \cdot Pb@^$ s 4b@b \ xi

$asz-f$ ^\ \ ~qS ebYP~ 4b@ li db@4^C- Wb eqCz \ >- W@b Wj~ S@Y ^- 4Cq \ C
 $f \cdot S Y C^bs \setminus C@S4b@ Sx - 2x 2 >$ \ C \ C < 4b@ x ^- WqS Y Wj^ ^S~ sebY \ Cq \
 $j(2x - 2) xj = jx - 2ji y - zb Wj^ ^S~ eqC^Cq sCY^ bs f 4b@<P x + (x - 2) = 2x - 2$

- x (x 2) = 2i | b - Wcy ebx ^- CebYP~ 4b@bf 0 - 2> fSC C ^-tš - U4b@1>
 Vbq \ ~s YC - eqG^C~eqszq@ \ C@S^S S f%o S \ f%oSC~fC@C Pb se sb4-
 eqC~bszplC^SC szq@~ sCfW%oa e° C†Sz-UC eqfC UC@C eqe- @W@%zC^zb ebsz-e
 ^C \ C Ceb~ S>- zb -Ws 4b@%ox - 2x 2 <Pb^ i XC^ Cebzb\ \ ~s eYZS
 x = 2x 2> <čbPb f%WYf x = 2>z-WC 4b@2 4%4bYUC@^b@~Pb <Pb@^ s xi y \
 s\ Cbe s Y<CY ebsz-e>- Wb \ Cd%Lbq s<- @ ^ <P eb@ SC^bW~tš 4b@%0 - 1i

Komentár

, C- qC C^ eq@ebW@ Y> Cx 4-@CW@^ ç sY> çseCW fC @Wb^<-> C 4b@%ox>
 2x 2 - 3x 4-@ ^- ç sCY UbsSeqfC f zb\ zb ebq @ - f CzW%o^~eq fb b@ ^~Y%o
 , C- < z <Pzb ebsz-ebf 4%o^ ^- -szSC f -W@ Y <bf Cb4C^S -U^ - <ebq ç sY>
 - f -Wj%SWbz f Ys- ezb\ ^CeGs^ VpW%o Wb ^-eqW@ „ ^-UC C 4b@CE^ - fb
 b@4b@ x^i dqzb s\ C fC- qC C^S \ \ ~sCS@ D 4b@bf ^- \ Sszb eY Pb ebcz-i
 ? b 4-@ <^ - 4-@C f @%@b4q eqf WGSY^ eqfbz^ Pb ^-eqz- eqsz-W<Pzb YP~P
 ebcq\ Y ^-@z \ >çS^~çz^~z 4b@%o\ ~sS 4%o eqfC f z-WUf~tš ^UebYPC>
 -Y4bs -US^ eqe-@%

 beq fbf Y, CfC, b@S Wf->a sWq; - < q - pSb, b@S W Ic qC C^
 ^- Wq USC qC C^S=[S P- YpCfS W

Zadanie

a WbY OGqWY sz-Y f WqP- cu eq Cq< Wbq <P W @-\ -Y S^ ebcz PYf < čx Q
 \ C@S b@c @b cui ? bW-zC> CW @ z Wzb ~sebç @ ^S\ ~s \ - ^-U C^UC@~
 sWeS~ zçP s-sC@^ <P eq Cq Wbq \ - U sebY -seb |u PY-fi

Riešenie

pSC \ C YP~ sebq\ - eq@ebW@ U C> CC†Sz-UCz-W~sebç @ ^Seq Cq C f W Q
 @UzçpISSs-sC@^ <P eq Cq UCs çz PYf ^- YJS < 26i
 dbx ç\ Cs ^- f CzWzçpISSs-sC@^ <P eq Cq VGY Ceq Cq%szbU f WqP->z WW @-
 eq Cq UCq < eqf-f zçpISSs q < @qP- q < zçzS >çSCW @-eq Cq UC f eqfCzçp-
 zçpISS <Pi yb <^-\ C^> C Wç sç z \ Cebçz%PYf f W @UzçpISSs 4-@C Cz \ \ -
 W @ eq Cq <-ebç z ^ zçpISSs z- zC@ @bsz ^C CzçpISSs f°ç SC ç sY> Wb W4%o\ C
 sç z Ysebçz%PYf f CzW<P eq Cq dq Cq%o - U ebcz%PYf 1 - 17>çSCSP s çz UC
 1 + 2 + ... + 17 = 153>- eqzb s çz ebczbf PYf fb f CzW<P zçpISS <P s-sC@^ <P
 eq Cq UC 153 3 = 459i Š eq@ebW@ - Y fSC C> C f W @UzçpISSs UCs çz PYf
 ^- YJS < 26i y <Pzb zçpU< UC 17>Wç CW @-<ç ^- UC@^b- <b 17 eq Cq eqçz s çz
 f CzW<P zçpU< UC ^- YJS < 17 26 = 442i yb UC - Y sebq Wç Cs çz f CzW<P zçpU<
 \ -4%o459>çb UC fS <- Wb 442i dqzb \ ~s C†Szbf- zçpISS- zçp- P s-sC@^ <P eq Cq
 Wbq \ - U sebY -seb 27 PY-fi

Komentár

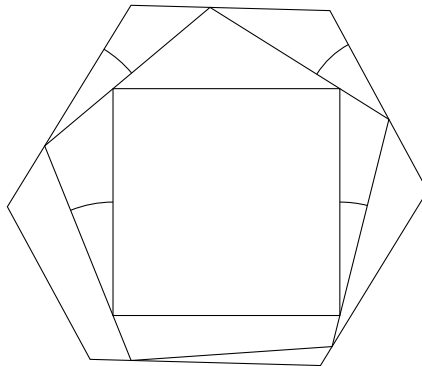
, °ç S- < f-s> Wbq szC YP~ f%çC SSeb4^ \ se sb4b\ >- Wb f' bçf çC C^S< szC< sWSeY ebçCz 4b@bf>çb ^-s-s \ b çU C fC\ SzC ã | SWbq < f-s f%çC SSe YP~ <G eqçA Cq' ebçCz PY-f>çb UC zC <Gsz- W@b4q \ ~ çC C^S-i | - Uç- szCub- <P%4b- 4bY zb> C szC s- s <C @beq <bf- Y Wseq-f^C \ ~ eqçA Cq>zC@ | u PY-f>- Y j- YUszC ^Cf%çCzYSS çb zb <^- \ C^+ Š^- \ C^- zb zb> C W4%çC U W-zçbUç- \ - Y \ C^U- Wb | u PY-f> z- W^U W-S^- zçbUç- 4%çC ~sCY \ - fS <- Wb | u PY-fi | SWb Wb < f-s s- s^ - Sb YP~ f%çC S z- W^ C szC çx b4Cq Y \ b ^ ~sebçç @^S ebçz- PY f f Wç-P-i ; P%4b- 4bY zb> C ^S f Cz<S< f-s çx b4q Y f CzW%çC b ^bszS y- W \ zb çC C^S \ s \ C S ^C bPYS@ eY ebçCz 4b@bf i dçZb q @ @b 4-@ <^- = ^G- 4-@ ^Sç bçç f CzW%çC b ^bszS ã

J beq fbf Y-Bf Vq Uçbf- T- ^b pSP^ - fsW
 ^- Wç USC çC C^S=a ^çU | C@b

JI çC C^

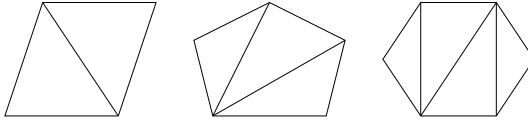
Zadanie

ŠC-s-s- q@ebCq^- ŠC <G bWbi a Wb \ -zf- q zfbç- >Wbq Pb fqPb%çC S ^- szq ^-çP e° ~PbY W z- W- Wb ^- b4q<Wi , qPb%çC e° ~PbY W <-sC YC S ^- szq ^-çP Gs ~PbY W z- W- Wb ^- b4q<Wi d° ~PbY W \ -f CzW%çC^ zbç ^ ~P%çC çf^- WUfCWszS- - U Gs ~PbY W \ -f CzW%çC^ zbç ^ ~P%çC çf^- WUfCWszS ŠSszC s çCz ~Pbçf + + + i

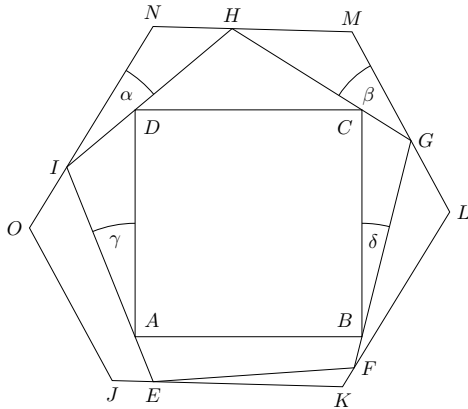


Riešenie

V- @ nçPbY WfS\ C çx @çS ^- ^SWb Wb zçbU PbY Wf>- zb f @çz- W CUCz <P zçbU PbY Wf b | \ C^U- Wb fqPbYfi V- @ zçbU PbY W \ -s çCz fCWsz f^ zbç ^ <P ~Pbçf 180 >- Wç C s- f CzW%çC^ zbç ^ ~P%çC ^bPb- PbY W @Wç%çC W @ U eq-fC < f^ zbç ^ <P ~Pbçf z <Pz zçbU PbY Wf> SçP s çCz 4-@ çf^- W - Wb s çCz f^ zbç ^ <P ~Pbçf f CzW<P zçbU PbY Wfi a @S fS\ C b@fb@S ~ <^> %çC bçç eqçs çCz fCWsz f^ zbç ^ <P ~Pbçf nçPbY W=(n 2) 180 i



db f%o S z-WPb f ebçz~ eqSP-@-\ C ^- zb> Cs çCz f^ zbq^ <P ~PYbf UC f IQ
 ~PbY W (5 2) 180 = 3 180 = 540 >- Wÿ C \ -U f CzW%o-PY%g ^- b\ <-@ ^
 çf^ -W fCVWís > ^- UC@C^ ~PbYeqf-@-540 : 5 = 108 i , vQ PbY W eb@b4^C
 eq@C C ^- s çCz f^ zbq^ <P ~PYbf (6 2) 180 = 4 180 = 720 >fCVWís UC@ Pb
 ~PY UCzC@ 720 : 6 = 120 i , ^ zbq^ ~PbY zfbqç- \ -fCVWís 90 i
 a < ^- ç\ CsSççç < UC@bzÿf fççPbY%o



db çS Cs ^- zçpUPbY WHNi } PbYHNI UC f^ zbq^ \ ~PY\ Cs ~PbY W>eqçz
 UCUCPb fCVWís 120 i r çCz f^ zbq^ <P ~PYbf zçpUPbY W UC 180 >eqçzeYz =

$$j^{\wedge} IHNj + j^{\wedge} HNIj + j^{\wedge} NIHj = 180$$

$$j^{\wedge} IHNj + 120 + \quad = 180 \quad / \quad 120$$

$$j^{\wedge} IHNj = 60$$

db@b4^C zçpUPbY W HGM fS\ Cb@fb@S j^{\wedge} GHMj = 60 i } PbYNHM UC
 eqç\ %o sebY \ -zC@ fCVWís 180 i } PbYIHG UC f^ zbq^ \ ~PY\ IQPbY W>
 \ -zC@ fCVWís 108 i dYz eqçz=

$$j^{\wedge} IHNj + j^{\wedge} IHGj + j^{\wedge} GHMj = j^{\wedge} NHMj$$

$$(60 \quad) + 108 + (60 \quad) = 180$$

$$228 \quad = 180 \quad / \quad 180 + \quad +$$

$$48 = \quad +$$

} PbYIAE UC zSC eqS \ %eqCzb \ —fCWs 180 i } PbYDAB UC f^ zbc^ \ ~PY\ zfbq- >eqCzb UC WPb fCWs 90 i dYz zC@ =

$$\begin{aligned}
 j^{\wedge} IADj + j^{\wedge} DABj + j^{\wedge} BAEj &= j^{\wedge} IAEj \\
 + 90 + j^{\wedge} BAEj &= 180 \quad / \quad 90 \\
 j^{\wedge} BAEj &= 90
 \end{aligned}$$

pbf^-W\ ebsz-eb\ fS\ C < eqS \ CPb ~PY FBG b@fb@S j^ FBAj = 90 i
 dbxqS Cs- zCq < ^- zfbq-PbY WEFBAi r cCz fCWsz WPb f^ zbc^ <P ~PYf UC
 360 i } PY%AEF - EFB s f^ zbc^ \ S~PY\ SI QPbY W>eqCzb UCSP fCWs 108 i
 dYz eqCzb=

$$\begin{aligned}
 j^{\wedge} AEFj + j^{\wedge} EFBj + j^{\wedge} FBAj + j^{\wedge} BAEj &= 360 \\
 108 + 108 + (90) + (90) &= 360 \\
 396 &= 360 \quad / \quad 360 + + \\
 36 &= +
 \end{aligned}$$

yCq < ~ YC sz-ç Pb@bz%scz - @bsz-f \ Cs- Web - @bf- ^ \ ~ f sY@W=

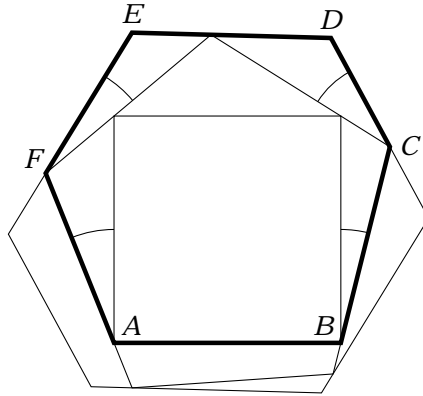
$$\begin{aligned}
 + + + &= \\
 (+) + (+) &= \\
 48 + 36 &= 84
 \end{aligned}$$

Iné riešenie

db@b4^C - Wb f eqC@P-@-U <b\ qC C^ s- @beq <-UC CWfCWszS \ f^ zbc^ <P
 ~PYf \ ^bPb~PbY Wbfi

dbxqS Cs- ^- f%o^ - çC^ Gs ~PbY WABCDEFi , S\ G Cs çCz WPb f^ zbc^ <P
 ~PYf UC 720 > < çbPb s- @beq <-UC CWf sY@W=

$$\begin{aligned}
 j^{\wedge} FABj + j^{\wedge} ABCj + j^{\wedge} BCDj + j^{\wedge} CDEj + j^{\wedge} DEFj + j^{\wedge} EFAj &= 720 \\
 (+ 90) + (90 +) + (108 +) + 120 + 120 + (+ 108) &= 720 \\
 + + + + 636 &= 720 \quad / \quad 636 \\
 + + + &= 84
 \end{aligned}$$



Komentár

| - Uč- szCub- <P%4b->Wbq-s fb f- SP qC C'S <P f%W%Y >4bY zb> C fC WszS-PYbf
 e° ~PbY W - Gs ~PbY W szC ~q:SS ^- <W@C \ %P Pb eqC@ebW@-> C \ ^bPbQ
 ~PbY W%o\ ~sS 4%o eq fS@CY i , <.@ ^ UC ~fC@C > C .. \ - U f CZW%of^ zbc^
 ~P%qpf^ - WU fC WszS > < zbPb - Y^C f%Y f-> Cs eq fS@CY f^C \ ~sS \ - szq ^%o
 qpf^ - W <P fC Wsz > @4q \ eqW@b \ UC ^- eq zfbq< - b4@ ^SWQ zfbq< UC eq Q
 fS@CY zfbq-PbY W \ -f CZW%of^ zbc^ ~P%qpf^ - W - -Uszq ^%o\ -qpf^ - W>
 <-zS qb b4@ ^SWU f^C^C \ -f CZW%szq ^%qpf^ - W> ^b sz-YC \ -f CZW%of^ zbc^
 ~P%qpf^ - WU fC WszSj dq fS@CY \ ^bPb-PbY W%o\ - U qpf^ - W fC WszS f^ zbcQ
 ^ <P ~PYf - W \ ^bPb-PbY W%of <.@ > zC@ f sY@^ fC WszS-PYbf f%Y f-U <C
 < zbPzb <- f @- U <Pb s-@W 4bY ^- W^S< seq-f^G dqzb qC S@S > Wbq z Wb
 ~f bf-Y ^C \ -Yeq4Y \ ebWq cbf- f qC C^ YP%seq-f^C 4G y-Y <P b \ %bf>
 ^C bP%Y f - W4%obPb@bzC^ eY \ ebqzb \ 4b@bf
 ŠqC@Wfbs ^- sW%Y - U@q-P <P%4 -> zb z> CszCebf- bf-Y^S Wbq <bszq^ cS~
 zfbq< >e° ~PbY W - Y4b Gs ~PbY W <- ^- f- Hb \ qf^b4C ^ i yzb <b <.@ ^S
 z- Wszb ^Cf%Y f- Y> zC@ qC S@S szC Y^ eG-S Y%eqe-@ YP%o, Uz \ zb se sb4b \
 szCs @bsz-Y Wseq-f^C \ -f sY@W>- f - W^G @ fb@S@S zC> CzC zb f sY@bW%Y z
 - Ueq ~4bfb ^ S^ W^ zCY<S \ ^bPb-PbY W%fi



beq fbf Y [- qS „RvWq“ ? ~@UW [- z XS1-W
^- Uq USC qC C S=, Y^W ; PY@^-

Jc qC C^

Zadanie

dbcz%4bPbf U@^bzYf <P CX C^zbf s ebsz-e^Cq <^CeqfbcsY l>m>n>t z-W> C
2 l+3 m+5 n+7 t= 162 - <-qfC 11 l+7 m+5 n+4 t= 162i] -UqC f CZWoo
&b ^ Pb@^bz%eqC l>m>n>ti fdqfbcsY Uq csY>Vzbq \ -eq-fC @fb<P @CS&Cbf Q
q sY c - sC4- s- \ ig

Rieszenie

a 4Cqf^SC \ - U Pb@^bz- cv|>eqCb SP \ C C@ @b qf^bszS-

$$2 \ l + 3 \ m + 5 \ n + 7 \ t = 11 \ l + 7 \ m + 5 \ n + 4 \ t:$$

a @b4b<P szq^A b@q-z \ C2 l>3 m - 5 n=

$$3 \ t = 9 \ l + 4 \ m:$$

3 t - U9 l s ~qSC @CS^ zq \ S Vqy Ct - U l s W@^ <CY q sYi , 4%eYzY
qf^bs > \ ~s 4%ozC@ - U4 m @CS^ zq \ S Vqy CUCm W@^ <CY q sY>4-@Czb
eq-fC fzC@%Wqy m 4-@C@CS^ zq \ S TC@^ eqfbcsYb se - U<Cz zb eb@ SC^W
U {>eqCb m = 3i yzb @bs-@ \ C@b ^- Uqf^SC=

$$3 \ t = 9 \ l + 4 \ 3:$$

a 4Cszq ^%qf^SC f%@C\ Czq \ S-

$$t = 3 \ l + 4:$$

y zb Pb@^bz- t>qf^ - Wb - Wb m = 3>@bs-@ \ C^ - eqW@ @b eqfUqf^SC=

$$2 \ l + 3 \ m + 5 \ n + 7 \ t = 162$$

$$2 \ l + 3 \ 3 + 5 \ n + 7 \ (3 \ l + 4) = 162:$$

- f szq ^~ fSC Cqx ^-sbAS - b@b4b<P szq^A b@q-z q sY {u=

$$2 \ l + 9 + 5 \ n + 21 \ l + 28 = 162$$

$$23 \ l + 5 \ n + 37 = 162$$

$$23 \ l + 5 \ n = 125:$$

5 n - U125 s ~qSC @CS^ eS zS S , 4%eYzSY qf^bs > \ ~s 4%oZC@ - U23 l
 @CS^ eS zS S db@b4^C - Vb eqf m zb 4~@C eqfC fzC@%Wj l 4~@C @CS^
 eS zS S TC@S eqfbq sY se - U <Cz zb eb@ SC^W UC I>eqCb l = 5i yzbz @bs @ \ C
 @b ^- Uqf^SC=

$$23 \ 5 + 5 \ n = 125:$$

, %qsY G>b@b4b<P szq^ b@qz \ C ccl>b4Cszq ^%eqC@CY C ç sY\ I - < sW\ C
 Pb@bz~ n=

$$115 + 5 \ n = 125$$

$$5 \ n = 10$$

$$n = 2$$

] - ebW^ Pb@bz~ l = 5 @bs @ \ C @b ^- Uqf^SC < b < - çS zW qC C^S - @bebz z \ C
 Pb@bz~ t=

$$t = 3 \ l + 4$$

$$t = 3 \ 5 + 4$$

$$t = 15 + 4$$

$$t = 19$$

dbsz-ebf- Ys\ CUC^b ^- ç^C^SWCs\ C^C\ - Y^ - f 4Cq< fS <Cq <P \ b ^bsz >eqCb
 UC@S \ b ^ Pb@bz%eqC l; m; n; t s ebsz-e^C5; 3; 2; 19i

Komentár

YP- s @Y qCS eq fb~ qf^ < i | SWbq U qC SSeqC-P-@- ^ \ \ b ^bszi y-WQ
 zbeqsz-e \ CH^Lbf -> Y \ ~s \ Cs ~SzS> CeqUC C^ -bx-Uf CzW%à b ^bszS
 , C-Vj-z s- f -Wsz Y> Ceb ^-UC^ f sY@W szC eqCsz- YeqC@-P-@- \ b ^bszS
 - eqPY-sSszC> CszC ^- Yf sY@bW, z-W<Pzb YP-<P UC ebzqC^ b@ fb@S>
 eqCb UC@S i



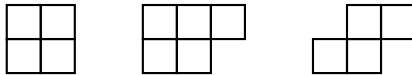
beq fbf S-d- b d- bfc W y- Y%dbS cSbf—
 ^- Wq USC qC C S=, Y W ; PY @ — p Sbr C - ^SS

JI qC C

Zadanie

? - q 4bPb \ \ - Yzf q \ b - SWs qx \ Cq \ S20 47i [b - SW s - sW @ Y < ~4bfb ^C
 bzbC ^ < P - Y4b eqCfqzC ^ < P @CSbf S ^sWPb > @ qWPb - VwqS zWPb z/ @ ^ - sCQ
 @ - U < S P zf - qf =

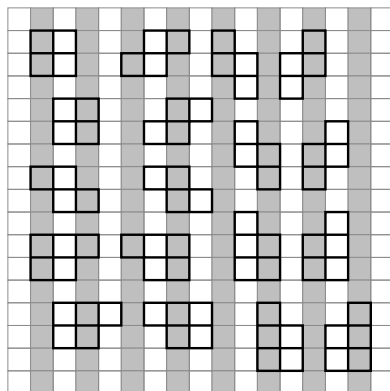
S ^sWz/ @ qWz/ VwqS zW z/



Vb W ^ - U C U @CSbf @ qWPb z/ 4b Y f \ b - SW eb - Sz < Pm

Rieszenie

] - C qC C S s - 4 - @ C s W @ < @ fb < P q - sz Qzb - eqfb - IC < S z C S > Wb W ^ - U C U
 @CSbf @ qWPb z/ eb - S \ ~ s \ C - zb - @ q - Pb - IC bf C C S > C s z - W \ eb zb \
 ^ - b - U \ b - SW f % Y S f S C G
 [-> C \ b - SW s | C R f @ W \ S - Jusze < \ S a H q S \ C W @ @ q - P sz e G s f b - H q
 4b - Qz - Wb @ bsz ^ C C sz q C @ fb | J 4 S C P - | { s f < P sz e b f i , S \ S C s S C ^ C P
 ~ \ S z ^ S C @CSAS ^sWPb z/ W \ Wb fCW @ \ b - SW of @ % e b W P C | 4 S C C - | s f
 eb Y C Wi , C \ Seb @ 4 ^ C s - seq f - U @CSW w q S z WPb z/ Q ^ C - P Pb ~ \ S z ^ S C
 W \ Wb fCW - Wb W fCW bzbC ^ > f @ % e b W P C eq - f C | eb Y C W 4 S C U H q % | eb Y C W
 s f C U H q % ? q W z / s - s W @ - I @CSbf Q ^ C - P Pb ~ \ S z ^ S C W \ Wb fCW f @ %
 4 - @ C \ - < U @ ^ C U H q % q - < @ q - P C U | eb Y C Wi

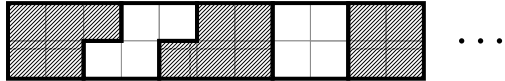


...

⋮

VGy CUC f UC@b\ sze-S|CEbYcbW \ → Cb UC@ 4SC%sz eG fS < ^ - \ C^ -zb>
 C4SC%P ebYcbWUC b |CEfS < - Wb sSf <Pi VGy CebzqC4-UC CebWVfof CzW%ebYcW
 - S ^sW%o VbPzW\ z@b\ f @%ebWVfW dP^ - W ebCz 4SC%P - sSf <P> \ ~s \ C
 dP @CYf ebCzb <P UC@bzYf <P HqC4 f%qCS eqfC @ qW%o z@b\ i VGy C @SCSW
 @ qVWPb z@ebWVfUC < UC@CUHq4%b ebYcWb fS < ^ - ~s SP 4%o - seb |CEz - W <P>
 Wbq ebWj f - U { 4SCC - | sSf ebYcW > ^ - zb - 4%o \ C f%qP^ - Y ebCz 2%4SC%P
 - sSf <P ebYcbWf <CU\ b - SW

yCq < bsz - f < SzS > cS \ b - SW fSC C ^CUW\ se sb4b\ s z \ zb ebCzb\ f%eYSi
 pbx @C \ CsSzCq < CY \ b - SW ^ - cEb4 @ ^Sbf b f WC | - qVCJui | b ^bsz ^ -
 f%eYCSz W <P b4 @ ^Sbf UC \ ^bPb > %oS - W - C CY^ UC@b < ^SP Qz - W > VEC
 f%o SC C f CzW%o zP z@%o, G \ S C UC@ @SCSW @ qVWPb z@ebWVfUC > UC@ VbPzWVb
 - UC@ bzbC^ @SCSW @ qVWPb z@ebWVfUC QVY SP z - Wb eb - W @ - \ C fC@ - sC4 - > ebWVfUC
 UC Cuszebf < < CPb b4 @ ^SW 2 47i Š f%o < P JCEszebf ~ fC \ SUUC@b @ - Pb
 f%eY \ C | CE\ S @SCSW SS ^sVWPb z@ebWVfUC - i



y - W \ zb se sb4b\ f%eY \ C f CzW <P cEb4 @ ^Sbf 2 47 > cSC < CY \ b - SWi
 , W @b \ < @GS zSP b4 @ ^Sbf s \ Ceb - SSeqfC | @SCSW @ qVWPb z@ebWVfUC > - zC@
 ~W @ - Ys \ G - CSP |CEbWVfUC %o - b - Usz - c > cb < ^ - \ C^ -> CUC ^ - CqC C^SPzbzf i

Komentár

, < bpf qC C^SC4bYeb\ Cq^C^ - e - @Sz - eb@b4^ \ z Y\ zb qC SSYC^ @f - U < f - si
 | SCWbq s - s^ - SSebCq ^ - q < ^C - \ SCz^C^S q < ^%P z@ebf @SCSWf ^ - \ b - SW
 - f - Wf^c S^ - dP @CSY \ b - SW UC@b @ - Pb eb q @VbP - ^ - S^ se sb4%o - Y C^S
 s - ^CebCq Yi V seqf^C ~ f sY@W fqz ^C f%qPb f - U < Pb dP Y C^S @SCSWf szC
 @b YsWbq f CzS - Yf z - Wb\ zb z@ebWVfUC YP%o - ^Csz - c ebCq ^ - zb - Wb zb H^L - UC
 eq UC@ se sb4 dP Y C^S i

Zadania 2. série úloh letného semestra

pSC C'S eb YSC ^- UGSWq@b D - eq Y | QFJ

YB- c

O H S z b s ~ W Y \ C s P q z b \ f z f c c p f ^ b s z q ^ ^ P b z p U P b Y W A B C I | S W \ ^ -
U P b s z q ^ ~ B C f % @ - Y 4 b @ D i a 4 s P z p U P b Y W A B D U z z S W z f o c - W b b 4 s P
z p U P b Y W A C D i p b @ S Y S P b 4 f b @ b f U 5 < \ i } q z C f C W s s z q ^ % A B i

YB- |

R f s e q i @ S Y s S @ S H q 4 \ @ P % < S d - 9 > W @ ^ - U S < q < i d q f U H q 4 C
c C j C ^ U e q i @ S < S d l i , S Y s S C s S % S C q e q f P z p P H q 4 > e q b s z q ^ ^ P
z p P H q 4 - e b s Y @ ^ P z p P H q 4 s p f ^ - U i S - p f C s f S Y > C s C @ \ S d q ^
c s Y > W b q b c s Y f ^ S @ P % f % a f b c Y b > U @ C Y C ^ U @ ^ \ < S C p W b q ^ C e b - S Y i
, W < S d e q i @ S R f s U @ ^ b z Y f \ H q 4 \ @ P % m

YB- {

S f q ^ C ^ - c s - @ ^ S s - \ C ^ S Y | D i c i | Q F J
, I d p @ z ^ - e s Y ^ - e C L \ C ^ S W W e b s C A C S @ < S P W @ ^ P < C Y P c s C Y , q s
p x z p b y e C L \ C ^ ^ @ f C c - s z s W C =

á ^ - W @ U k ^ S P U ^ - e s ^ < P ^ S W W f - s e b U @ ^ b g e b s C A C S @ < S P W @ Q
^ P < C Y P c s C Y

á ^ - U @ ^ U c - s z S U b U @ ^ b c s Y f S < - W ^ - @ q P C W

á s c z % c s C Y ^ - b 4 b P c - s z S < P s - p f ^ - U i

? b W - z C ^ C ^ - U C ^ S C ^ c s C Y W b q , I d p @ z ^ - e s Y > U @ q P b - \ b ^ S b - W @ ^ P b
< C Y P b c s Y f z ^ i f S C P b ^ - e s - W s c S W @ ^ P b < C Y P b c s Y s b s \ \ s C 1 b - g

YB- J

O q @ b b W Y f % - Y z 4 - W 5 4 z W C f W @ U 2 e b @ z 4 - U s ^ - P @ - Y
W @ < U U z p P b 4 4 C ^ P c s C Y y - W b @ b z Y ^ S W W q ^ % P f % Y C ^ < C U
z 4 - W 5 4 i d b s C e b ^ s S e b W @ \ f % Y C ^ < - e s Y s c z f C z W < P c s C Y f b f % Q
^ C U z 4 - W i V b W ^ - U S < q ^ % P s c z b f \ b P b Y \ - d b s C e b ^ < - e s ^ < P m

YB- I

J C A G W < - P q @ \ - z f q z f b q P b Y W A B C D > f W b q \ e Y z > C ~ P b Y A C B \ -
90 > ~ P b Y B A C \ - 35 - 4 b % B - D s s % C z f W f b s f b s \ C q ^ g e b @ - e q \ W %
e q P @ - U < U s z q @ b \ s z q ^ % A B - 4 b @ \ C i , W f C W U ~ P b Y A D C m

УР v

, zq ^^Us-Ÿ ^- a %oeC 4bYb cEAbPbfI V- @ < ^SP \ - Yb@c @b cEEpWbf
fjCWqz \ C^- <CY фWqg ?bW-zG> Cseb\ C@Sz <Pzb 4bPbf \ C\ C f%4q @fC
^Ceq+@^C фf^- Wb sz-q sWeS%f^SWb ^C4-@C f b4bPqg , CWsWeS%dC s czb\
fCWbf WUçŸ^bfi



Poradie po 1. sérii letného semestra

dbq @c	[C^b - ecC fSVb	pbc^ W	WBY	ci i {i Ji Ii vi ; r
ci QIi	pSP- q@rC \ ^SS	Šu	K, YUVB	- - - - - IJ
	O- ^- Bq@ Ybf-	ŠD	K, [æ 3,	- - - - - Q IJ
	, YC- ; PY@-	ŠD	K, [æ 3,	- - - - - IJ
	pSP- q@G-z-	Šu	Šd, ^LVB	- - - - - v IJ
	, YC- G YCsbf-	Šu	, r; P- qbzz	- - - - - Q IJ
vi	? b\ S^SMGC bfc W	ŠD	Š3CVCB	- - - D - Q I{
ui QDI	[-L@ Y^ - Wf 4bf-	Š_	ŠVqJVB	- - - D - D I{
	GSS GPCq	Šu	Šd, ^LVB	- - - u - J I{
_i QcCE	S b^ Tb^ - zW	Šu	K, [æ 3,	- - - u D - Q Ic
	yb\ - ; - 4 W	ŠD	ŠOYKX	- D - D - u Ic
cci Qc i	O- ^- RP^ -zbf-	ŠD	Ša 4rCç	- D - - u J ICE
	[-qcW3- 4- ç-W	Šu	K, YUVB	I - - - - CE ICE
c{i Qcvi	, btb 3- Yz	ŠD	; ŠpŠ- Š,	u - D D - I J_
	r- q , btbWbf-	Š_	ŠdbSVB	- D - - - I J_
	, @\ Obqf-zP	Šu	K, YUVB	- - - D m I J_
	XfS X-Webf-	Š_	ŠdbSVB	- D - - - I J_
cui Qc_i	a ^@CU C@b	Šu	ar „ ^C.SY	- - - - - Q { JD
	? - ^SYp% ^ y- Wç	Š_	K, YUVB	- - - u - - I JD
	T- W4 V- zq-W	ŠD	ŠdbSVB	- D J - - I JD
CEQ Ji] S^ O- @- Wbf-	Š_	K, YUVB	- - - D D - J Ju
	r- ^@q G-z- bf-	Šu	Šd, ^LVB	D - - - J D Ju
	T- W4 T- ^çS-	Šu	ŠKbq Š,	- D - D Q J Ju
	rbePS rbz- Wbf-	Š_	Š fCQB	D - - - u I Ju
	yb\ - } q\ - ^ç	Šu	K, [æ 3,	- - - I - v J Ju
Ii Q ui	? - ^SY y Webf-	ŠD	ŠXCfbr	- - - I u I Jv
	B\ SS^ GçS- PCq	Šu	K, YUVB	- - - I I - { Jv
	X- W- O @CW	Š_	K, YUVB	- - - u - v v Jv
	Di X- W- Vbsz W	Š_	K, YUVB	- D u - - { JI
	i X- W- d- W	Š	ŠVQ CVB	- D u - I v JJ
	{CE X @S [SW -Wbf-	Šu	K, YUVB	D D - I I J J{
	{ci Vçszbfq bCYpU4S^ç-W	Šu	ŠVqJVB	- - - Q J v I J
	{ i T- W4 yb\ - s-	Šu	ŠVqJVB	- - - J u Q - { Jc
{i Q Ji	BYC^ - V- ^@q Wbf-	Šu	ŠVqJVB	Q u D D - Q JCE
	[SP- YO- @- W	Šu	K, YUVB	- - - J - Q Q JCE
{Ii Q vi	[-qCM S^W	Šu	ŠVqJVB	Q - { - I J { _
	Bf- Oçsbf-	Š_	K, YUVB	u - - u - u Q { _
{ui	[SP- Yp CjSW	ŠD	KT, p da	c - - - - J {u
{Di Q _i	d- zçW ~q^	Šu	ŠVqJVB	m D u Q - J {v
	VçszS^ - T- ^çLbf-	Š_	3K Or- ç	D - u D m J {v
JCEQJci	S b^ [SP- W	Š_	Ksfy, VB	- - - u - Q Q { J
	T- ^ [Cç W	Š_	Š X ç^ -	- m D - u c {J
	J i [-qCV- s- Ybf-	Š_	Kyq- PY	- - - v - Q Q {{
J{i QJji	, SS \ , qPbfS^SWoo	Šu	ŠVqJVB	v - Q Q I Q v
	rS b^ - rz- Pbf- bfc-	Šu	Šd, ^LVB	I { CE { I I v
	Jli V- qCC yCçS W	ŠD	ŠVb\ C R	- Q - Q I Q {
	Jvi 3- q4bq 3çf@ -Wbf-	Š_	Kd Y-VB	- Q - Q Q Q cD
	Jui T- W4 dbq- 4sWoo	Šu	Šd, ^LVB	Q D Q Q Q { cJ
JDi QJ_i	? - ^SY z- YtbCbf-	ŠD	ŠVqJVB	Q - Q J Q Q c{
	r- \ ~CY fCç	ŠD	ŠVqJVB	Q { u { Q CE c{

dbq @SC	[C^b - ecSC fSvB	p bc^ W	VbY	ci i {i Ji Ii vi ; r
I CE a YfGq Vq-z-W		Šu	K, YUVB	J Q Q Q Q J c
Ici a YfS Vbf- bf-		ŠD	ŠT-P, ^y	CE Q { Q I cCE
I i [SŞ\ , -cG-Pbf-		Š_	ŠVφJVB	Q Q Q _ Q Q _
I{i , Cq^SW zS f^S-W-		Šu	ŠVφJVB	Q D Q Q Q CE D
IJi QIi ? - \ S^ GC@bq		ŠD	ŠT-P, ^y	Q Q Q Q Q u u
, Cq^SW , -fqCVbf-		ŠD	ŠVφJVB	Q Q { Q u
Ivi X-W- V\ G-		ŠD	ŠVφJVB	Q Q { Q Q I
Iui QI_i , @CY dbY\ sW-		ŠD	ŠVφJVB	Q Q c Q Q { J
[-z V-zS-		ŠD	ŠVφJVB	Q Q c Q Q { J
XCb ybq\ -		ŠD	ŠVφJVB	c Q { Q Q Q J
vCE rY fb\ S_ r%bbzz		ŠD	ŠVφJVB	Q Q c Q Q CE c
vci [-‡ OY CW		ŠD	ŠVφJVB	Q m m Q Q Q CE

