*':/8'/3)"! > *BE>M>JB @HJIHJ>LDHG

*>LBA >K HC 7BILBF ?BJ &! \$#\$%

5 FH=7@9 = 7 CFDCF 5 H9 D I FDCG9

 $GRPaV \setminus [*'; R[R_NY Db_] \setminus R$

5 FH=7@9 == C::=79G

GRPaV\[*' D V[PV]NY CSSVPR

GRPaV\[+' CaUR_ CSSVPR`

5 FH=7@9 === GHC7? < C@89FG

GRPaV\[*' DYNPR \S ARRaV[T`4 FRZ\aR ARRaV[T`

 $GRPaV \setminus [+' 5 [bNY ARRaV [T$

GRPaV\[,'C_TN[VgNaV\[

 $GRPaV \setminus [-'5PaV \setminus [KVaU \setminus baNARRaV]T]$

 $GRPaV \setminus [.'5QW \setminus b_[ZR[a^4D \setminus a] \setminus [RZR[a]])$

 $GRPaV \setminus [/'Eb \setminus bZ \setminus SGa \setminus PXU \setminus YQR \setminus]$

 $GRPaV \setminus [O'ANW \setminus Vaf J \setminus aR FR^bV_RZR[a]$

 $GRPaV \setminus [1' J \setminus aV \mid T FVTUa^4 D_ \setminus eVR^$

 $GRPaV \ [*)' : VeV[T 8NaR S \ 8RaR_ZV[NaV \ S Ga \ PXU \ VQR_` \ S FRP \ Q]$

 $GRPaV \setminus [**'@V`a \setminus S Ga \setminus PXU \setminus YQR_` 9 [aVaYRQ a \setminus J \setminus aR]$

 $GRPaV \setminus [*+'5QcN[PR B \land aVPR \land S Ga \land PXU \land VQR_6b \land V[R \land N[Q B \land ZV[NaV \land [\land AVPR \land S Ga \land PXU \land VQR_6b \land V]]]$

 $GRPaV \setminus [*, 'D_ef 5PPR``S \setminus 8V_RPa \setminus B \setminus ZV[NaV \setminus [`$

 $GRPaV \setminus [*-'7 \setminus QbPa \setminus SARRaV \mid T)$

5FH=7@9 = J 8=F97HCFG

 $GRPaV \setminus [*'D \setminus dR_]$

GRPaV\[+'BbZOR_N[QEbNYVSVPNaV\[

 $GRPaV \setminus [,'9YRPaV \setminus [4FR^VT[NaV \setminus []]]$

GRPaV\[-' FRTbYN_ ARRaV[T`

GRPaV\[.'G]RPVNY ARRaV[T`

```
GRPaV \setminus [ /'HRYR]U \setminus [VPARRaV[T`DR_ZVaaRQ]
          GRPaV\[O'JNPN[PVR`
          GRPaV \setminus [1'5PaV \setminus [0f8V_RPa \setminus KVaU \setminus baNARRaV ]T
          GRPaV \setminus [2'Eb \setminus bZ]
          GRPaV\[*)'C_TN[VgNaV\[
          GRPaV \setminus [**'FRZ \setminus cNY]
          GRPaV \setminus [*+'7 \setminus Z]R[NaV \setminus [S8V_RPa \setminus ]
          GRPaV \setminus [*, '7UNV_ \setminus SaUR 6 \setminus N_Q]
5FH=7@9 J 7CAA=HH99G
          GRPaV \setminus [*'7 \setminus ZZVaaRR` \setminus SaUR 6 \setminus N_Q]
          GRPaV \setminus [ +' ARRaV \mid T \setminus N \mid Q 5PaV \setminus [ \setminus S 7 \setminus Z \mid Z \mid VaaRR \setminus ]
5 FH=7@9 J=BCH=79G
          GRPaV \setminus [*'B \land VPR` \land SGa \land PXU \land VQR\_ARRaV \mid T`
          GRPaV \setminus [ +' AN[ R_ \setminus B \land VPR]
          GRPaV \setminus [, 'KNVcR_ \setminus SB \setminus aVPR]
5FH=7@9 J== C::=79FG
          GRPaV\[ *' CSSVPR_`
          GRPaV \setminus [ +' 5baU \setminus Vaf \setminus S 7R_aNV[ CSSVPR_`
          GRPaV\[,'HR_Z\S CSSVPR4 FR`VT[NaV\[4 FRZ\cNY4 JNPN[PVR`
          GRPaV \setminus [-'5] \setminus V[aV[T5aa \setminus [Rf]N[Q5TR[a]4J]aV[TGRPb \setminus VaVR] \setminus SCaUR_9[aVaVR]
5 FH=7@9 J== CH<9F DFC J=G=CBG
          GRPaV \setminus [*'7URPX`N[Q8_NSa`]
          GRPaV \setminus [ +' 9eRPbaV \setminus [ \setminus S 7 \setminus [a\_NPa]]
          GRPaV\[ ,':V`PNY MRN_
          GRPaV\[ -' GRNY
          GRPaV \setminus [ .' : \ Z \setminus S FRP \setminus Q)
          GRPaV \setminus [ /' : \bZ S \setminus 5 QWbQVPNaV \setminus [ \S 8 V]baR
```

5 FH=7@9 =L =B89 AB=:=7 5H=CB

GRPaV\[*' = [QRZ [VSVPNaV\ [\S CSSVPR_` N[Q 8 V_RPa_`

 $GRPaV \setminus [+' D_R]NfZR[a \setminus S9e]R[\R]$

GRPaV\[,'7YNVZ\

GRPaV\[-' B\[RePYb`VcVaf \S FVTUa`

 $GRPaV \setminus [.' CaUR_G \setminus b_PR^$

 $GRPaV \setminus [/' 5ZR[QZR[a \setminus FR]RNY]$

 $GRPaV \setminus [O'CaUR_=[QRZ[VSVPNaV \setminus [N[QD_R]NfZR[a \setminus S9e]R]^R)]$

5 FH=7@9 L GHC7?

 $GRPaV \setminus [*'7R_aVSVPNaR`$

5FH=7@9 L=9A9F;9B7M 6M@5KG

 $GRPaV \setminus [*'9ZR_TR[Pf6fYNd]$

5 FH=7@9 L= 5 A 9 B 8 A 9 B H G

' 2+3*+* ' 3* 6+78 ' 8+* (=1 ' ; 7 4 , * ' : /8 ' /3) "! > * BE>M>JB @HJIHJ>LDHG

<u>'68/)1+/</u>)46546'8+596547+

$\frac{(68/)1+//}{4,,/)+7}$

 $GRPaV \setminus [+' \qquad \underline{CaUR} \quad \underline{CSSVPR}^* \mid FRTV \setminus [NY\% O_N[PU \setminus ^`bO\setminus_QV[NaR \setminus SSVPR^* \mid ZNf \mid OR \mid R`aNOYV`URQ \\ Na \mid N[f \mid aVZR \mid Of \mid aUR \mid 6 \setminus N_Q \mid Na \mid N[f \mid aUR_]YNPR \setminus _]YNPR^* \mid d \mid VaUV[\setminus _ \setminus ba^*VQR \setminus S \mid aUR \mid I[VaRQ \mid GaNaR^* \setminus S \mid ZR_VPN'] \\ 5 \mid ZR_VPN'$

$78\frac{(68/)1+///}{400.41*+67}$

GRPaV\[*' DYNPR \S ARRAV[T`4 FRZ\aR ARRAV[T`' ARRAV[T` \S aUR `a\PXU\YQR_` \S aUV` 7\]\ NaV\ [ZNf OR URYO Na `bPU]YNPR\ VS N [f\ RVaUR dVaUV [\ dVaU\ba aUR GaNaR \S 8 RYNdN R\ N` QV`P_RaV\[% ZNf QRaR_ZV[R aUNa N[f ZRRaV[T \S aUR `a\PXU\YQR_` d\VYY [\a OR URYQ Na N[f]YNPR Oba]_ \PRQb_R V[NPP_QN[PR dVaU aUR N]]YVPNOYR]_ \cV V\[\ \ S aUR 8; 7@ N[Q N[f \aUR_ N]]YVPNOYR $VNd = RTbYNaV \setminus [S] = N_aVPV \setminus NaV \setminus [V] = N^a \setminus VVV \setminus VQR = ZRRaV \mid TOf = ZRN \mid S_RZ \setminus RP \mid ZZb \mid VPNaV \mid S_RZ \mid RP \mid ZB \mid RP \mid S_RZ \mid RP$ GbowrPa a\ `bPU TbVQRYV[R` N[Q]_\PRQb_R` N` aUR $6\N_Q$ ZNf NQ\]a\ `a\PXU\YQR_` N[Q]_\efU\YQR_` [\a]Uf\YPNYYf]_R\R[a Na N \a\PXU\YQR_ ZRRa\V[T URYQ Of ZRN[\ \S _RZ\aR \] P\ZZb[VPNaV\[ZNf OR QRRZRQ] R`R[a V[]R \\[\ ZNf]N aVPV]NaR V[aUR ZRRaV[T\ N[Q ZNf c\aR\ dURaUR_ `bPU ZRRaV[T V` a\ OR URYQ Na N QR`VT[NaRQ]YNPR _ `\YRYf Of ZRN[` \S _RZ\aR $P ZZb[VPNaV \setminus [4] cVQRQM U dRcR_M aUNa #N$ aUR 7 \] \ NaV \ [`UNYY VZ] YRZR[a ZRN`b_R` a \ cR_VSf$ aUNa RNPU R^{\prime} QRRZRQ R^{\prime} R a N[Q R^{\prime} R a NQ a\ c\aR Na aUR ZRRaV[T Of ZRN[\cdot\ S RZ\aR] \cVQR `bPU `a\PXU\YQR ` N[Q] \efU\YQR ` N[\]]\ ab[Vaf a\]N aVPV]NaR V[aUR ZRRaV[T N[Q a\ $c\aR \ [ZNaaR^` bOZVaaRQ a\ aUR `a\PXU\YQR^` V[PYbQV[T N[\]]]\ab[Vaf a\ _RNQ _ URN_ aUR$]_\PRRQV[T`\S aUR ZRRaV[T `bO`aN[aVNYYf P\[Pb_R[aYf dVaU `bPU]_\PRRQV[T`\ N[Q \#P\ VS N[f $P\Z Zb[VPNaV\[\% N _RP_Q \S `bPU \ c \aR _ \aUR_ \NPaV\[`UNYY \ OR \ ZNV[aNV[RQ \ Of \ aUR \ 7 _] _NaV\[\ \ N \ QRYRTNaR \ aUR_R\S']$

#P\$ $8 RaR_ZV[R N[Q_RaNV[S_N_RN^N]R_VQ N_RP_Q \S aUR QV^]^VaV_[\S NYY PUNYYR[TR^ZNQR a\ N[f_QRaR_ZV[NaV_[Of aUR V[^]RPa_^4 N[Q]] N[Q] N_RPV_Q N_RPV_Q$

=[QRaR_ZV[V[T aUR cNYVQVaf N[Q P\b[aV[T \S]_\eVR` N[Q ONYY\a` PN`a Na N[f ZRRaV[T \S `a\PXU\YQR_` \S aUR 7_]_NaV\[\% aUR V[`]RPa_` ZNf P\[`VQR_ `bPU V[S_ZNaV\[N` V`]R_ZVaaRQ Of

- #5\$ N` a\ RNPU V[QVcVQbNY dU\Z aUR `a\PXU\YQR_]_\]\`R` a\ [\ZV[NaR S_ RYRPaV\[_ _RRYRPaV\[N` N QV_RPa_ #RNPU% N hD_\]\`RQ B\ZV[RRi\$% VS N[f3
- #*\$ aUR [NZR% NTR% Ob`V[R`` NQQ_R`` N[Q _R`VQR[aVNY NQQ_R`` \S `bPU D_\]\`RQ B\ZV[RR4
 - #+\$ $aUR]_V[PV]NY \PPb]NaV [N[Q RZ]Y fZR[a \S `bPU D_\] `RQ B \ ZV[RR4] | RR4 | R$

#,\$

- aUR PYN``% `R_VR` N[Q [bZOR_ \S `UN_R` \S PN]VaNY `a\PX #VS N[f\$ \S RNPU PYN`` _ #] RPVS fV [T aUR af]R \S \ d [R_\UV]\$ Of `bPU `a\PXU\YQR_\\ D_\]\`RQ B\Z\V[RR N[Q Ga\PXU\YQR_\\ D_\] $5 \ R\ Pbar R\ OR \ [RSVPVNY \ d\ [R_\ UV] \ Na\ N[f\ aVZR\ V[\ aUR\ Sbab_RW] \ NP^bV_R\ OR \ [RSVPVNY \ d\ [R_\ UV] \ Na\ N[\ f\ aVZR\ V[\ aUR\ Sbab_RW] \ NP^bV_R\ OR \ [RSVPVNY \ d\ [R_\ UV] \ Na\ N[\ f\ aVZR\ V[\ aUR\ Sbab_RW] \ NP^bV_R\ OR \ [RSVPVNY \ d\ [R_\ UV] \ Na\ N[\ f\ aVZR\ V[\ aUR\ Sbab_RW] \ NP^bV_R\ OR \ [RSVPVNY \ d\ [R_\ UV] \ Na\ N[\ f\ aVZR\ V[\ aUR\ Sbab_RW] \ NP^bV_R\ OR \ [RSVPVNY \ d\ [R_\ UV] \ Na\ N[\ f\ aVZR\ V[\ aUR\ Sbab_RW] \ NP^bV_R\ OR \ [RSVPVNY \ d\ [R_\ UV] \ Na\ N[\ f\ aVZR\ V[\ aUR\ Sbab_RW] \ NP^bV_R\ OR \ [RSVPVNY \ d\ [R_\ UV] \ Na\ N[\ f\ aVZR\ V[\ aUR\ Sbab_RW] \ NP^bV_R\ OR \ [RSVPVNY \ d\ [R_\ UV] \ Na\ N[\ f\ aVZR\ V[\ aUR\ Sbab_RW] \ NP^bV_R\ OR \ [RSVPVNY \ d\ [R_\ UV] \ Na\ N[\ f\ aVZR\ V[\ aUR\ Sbab_RW] \ NP^bV_R\ N$ dURaUR `bPU VTUa V` ReR PV`NOYR VZZRQVNaRYf \ \[Yf NSaR aUR]N``NTR \S aVZR \ aUR SbYSVYYZR[a $\S N P \setminus [QVaV \setminus [\$W N Q aUR QNaR \setminus QNaR \setminus dUVPU `bPU `UN_R` dR_R NP^bV_RQ4]$
- #,\$ $\label{eq:continuous_continuous$ 5\\PVNaRQ\DR_\\[N[Q\N[f]]YRQTR\Of\\bPU\\a\PXU\\YQR__\N[f\Ga\\PXU\\YQR_\5\\\PVNaRQ\DR_\\[N[f\Ga\\PXU\\YQR_\5\\PVNaRQ\DR_\\[N[f\Ga\\PXU\\YQR_\5\\PVNaRQ\DR_\\[N[f\Ga\\PXU\\YQR_\5\\PVNaRQ\DR_\\[N[f\Ga\\PXU\\YQR_\5\\PVNaRQ\DR_\\] dVaU R R R A N f S bPU 9N ` ` % e

%%

- #*-\$ NYY V[S_ZNaV\[aUNa d\bYQ OR _R^bV_RQ a\ OR `Ra S_aU V[N GPURQbYR *, 8 SYYRQ]b_`bN[a a\ FbYR *, Q&*#N\$ b[QR_ aUR 9ePUN[TR 5Pa _ N[NZR[QZR[a]b_`bN[a a\ FbYR *, Q&+#N\$ b[QR_ aUR 9ePUN[TR 5Pa VS `bPU N `aNaRZR[a dR_R _R^bV_RQ a\ OR SYYRQ b[QR_ aUR 9ePUN[TR 5Pa Of `bPU `a\PXU\YQR_ TVcV[T [\aVPR _ N[f Ga\PXU\YQR_ 5 ``\PVNaRQ DR_`\[| \ _ `bPU `a\PXU\YQR_ TVcV[T [\aVPR _ N[f Ga\PXU\YQR_ DR_`\[| \ _ `bPU `a\PXU\YQR_ bPU]R_`\[\ _ R[aVaf V` NPabNYYf _R^bV_RQ a\ SYYR N GPURQbYR *, 8\$4
- #*.\$ N PR_a\s\PNa\\[_RTN_Q\V[T dURaUR_ `bPU `a\PXU\\YQR_ T\c\V[T [\a\PR N[Q RNPU Ga\PXU\\YQR_ 5``\P\NaRQ DR_`\[UN` P\Z]\Y\RQ d\vaU N]]\\PNO\YR SRQR_N\\\`a\NaR N[Q \aUR_ \YRTN\Y_R^b\V_RZR[a` \V[P\[[RPa\\[d\vaU `bPU]R_`\[j` NP^b\V`\va\\[\S `UN_R` \S PN]\\va\\`a\PX _ \aUR_ `RPb_\va\\R` \S aUR 7_]_Na\\[N[Q `bPU]R_`\[j` NPa` _ \Z\V``\\[` N` N `a\PXU\\YQR_ \S aUR 7_]_Na\\\[\V _ UN` ORR[N`a\PXU\\YQR_ \S aUR 7_]_Na\\[\[4 N[Q \c) \]
- #*/\$ NYY\aUR_V[S_ZNaV\[_RYNaV[T a\ `bPU `a\PXU\YQR_TVcV[T [\aVPR _N[f Ga\PXU\YQR_5``\PVNaRQ DR_`\[\"_ `bPU `a\PXU\YQR_TVcV[T [\aVPRj` _N[f Ga\PXU\YQR_5``\PVNaRQ DR_`\[j`

- #9\$ N_R]_R^R[aNaV\[S_\Z aUR `a\PXU\YQR_ TVcV[T [\aVPR aUNa #*\$ `bPU `a\PXU\YQR_ #e\$ V` N U\YQR_\S_RP_Q \S `a\PX \S aUR 7_]_NaV\[R[aVaYRQ a\ c\aR Na aUR ZRRaV[T\ #f\$ V[aR[Q` a\ c\aR `bPU `a\PX Na aUR ZRRaV[T N[Q #g\$ V[aR[Q` a\ N]]RN_\ V[]R_\[_ Of]_\ef Na aUR ZRRaV[T a\ [\ZV[NaR N[f D_\]]\`RQ B\ZV[RR`_ O_V[T `bPU Ob`V[R`` ORS_R aUR ZRRaV[T4 N[Q #+\$ VS `bPU `a\PXU\YQR_\Q\R` [\a N]]RN_\ a\]_R^R[a `bPU D_\]\`RQ B\ZV[RR _ Ob`V[R`` Na aUR ZRRaV[T\ aUR 7_]_NaV\[[RRQ [\a]_R`R[a `bPU D_\]\`RQ B\ZV[RR _ Ob`V[R`` S_ N c\aR Na `bPU ZRRaV[T\ [\a d\VaU`aN[QV[T aUNa]_\eVR` V[_R`]RPa \S `bPU c\aR ZNf UNcR ORR[_RPRVcRQ Of aUR 7_]_NaV\[4
- #:\$ N QR`P_V]aV\[\S N[f]R[QV[T _% a\ `bPU `a\PXU\YQR_ TVcV[T [\aVPRj` X[\dYRQTR% aU_RNaR[RQ YRTNY]_\PRRQV[T _ V[cR`aVTNaV\[V[dUVPU `bPU `a\PXU\YQR_ TVcV[T [\aVPR _ N[f Ga\PXU\YQR_ 5``\PVNaRQ DR_`\[V` N]N_af _]N_aVPV]N[a QV_RPaYf V[c\YcV[T _ QV_RPaYf _RYNaV[T a\aUR 7_]_NaV\[_% a\ `bPU `a\PXU\YQR_ TVcV[T [\aVPRj` X[\dYRQTR% N[f Pb_R[a _ \ O T

 $\a\setminus$

= $[NQQVaV \setminus [a \land aUR \lor [S \setminus ZNaV \setminus [R^b \lor RQ \lor [N_NT_N]U #N$#,$ \ auv]$ $\underline{GRPaV} = *+W = aUR = 7 = NaV = ZNf = R^bV_R = N[f = D_1]^RQ = B + ZV[RR = a = Sb_V] = Value = Valu$ $NQcV^NOVYVaf \ S \ DU D_] \ RQ B \ ZV[RR a \ R_cR N N QV_RPa_ \ S aUR 7 _] \ NaV \ \ \ aUNa P \ BVQ OR$ ZNaR VNY a\ N RN`\[NOYR `a\PXU\YQR j` b[QR `aN[QV[T \S aUR V[QR]R[QR[PR\\ \ YNPX aUR R\S\\ \S `bPU D_\]\`RQ B\ZV[RR\ b[QR_ aUR YV`aV[T `aN[QN_Q` \S RNPU `RPb_VaVR` RePUN[TR b]\[dUVPU aUR $`UN_R` \ \ aUR 7_]_NaV\[N_R YV`aRQW N[f N]]YVPNOYR _bYR` \S aUR GRPb_VaVR` N[Q 9ePUN]TR$ $7 \ ZZV^V \ | N[QN[f]bOYVPYfQV^PY \ QV^PY \ AN[QN_Q b RQ Of aUR 6 \ N_QV[RYRPaV[T] \ ZV[RR S]$ $RYRPaV \setminus [N N QV_RPa \setminus N[Q S \setminus QRaR_ZV[V[T N[Q QV PY \setminus V[T aUR V[QR]R[QR]PR \setminus S aUR 7 \setminus] \setminus NaV \setminus [i]]$ $QV_RPa_i V_PYbQV_T aU^R N_IVPNOYR a N_QV_RPa_j ^RcVPR V_R AUR_P ZZVaaRR ^S AUR_P ZZVAAR ^S AUR_P ZZVAARR ^S AUR_P ZZVAAR ^S AUR_P ZZVAAR ^S AUR_P ZZVAAR ^S A$ $6\N_0\$ _ aUR _R^bV_RZR[a^ \S N[f \aUR_ YNd^ _ _RTbYNaV\[^ N]]YVPNOYR a\ aUR 7_]_NaV\[' =S \] _R^bR`aRQ Of aUR 7_]_NaV\[% N[f`b]]YRZR[aNY V[S_ZNaV\[_R^bV_RQ b[QR_ aUV`]N_NT_N]U`UNYY OR]_\cVQRQ Of N `a\PXU\YQR_TVcV[T [\aVPR dVaUV[aR[#*)\$ QNf` NSaR_ Va UN` ORR[_R^bR`aRQ Of aUR 7 = NaV = NQVaV = NQQVaV = N $dVaU aUR 6 \ N_Q \ N[f P Z Z VaaRR aUR_R \ N[Q \ bPU D \] \ RQ B \ Z V[RR \ UNYY Z N X R U V Z \ RYS \]$ UR `RYS NCNVYNOYR S\ N[f `bPU V[aR cVRd` dVaUV[aR[#*)\$ QNf` S\YY\ dV[T aUR QNaR \S N[f R^bR`a $aUR_RS \setminus S \setminus Z$ $aUR 6 \setminus N_Q \setminus N[f P \setminus Z Z \lor aaRR aUR_R \setminus S']$

aUR 6\N_Q Na N[N[[bNY ZRRaV[T V` V[P_RN`RQ N[Q aUR_R V` [\]bOYVP QV`PY\`b_R Of aUR 7_]_NaV\[[NZV[T aUR [\ZV[RR` S_ aUR NQQVaV\[NY QV_RPa_`UV]` Na YRN`a \[R Ub[Q_RQ #*))\$ QNf`]_V_ a\ aUR SV_`a N[[VcR_`N_f \S aUR]_RPRQV[T fRN_j` N[[bNY ZRRaV[T% N `a\PXU\YQR_j` [\aVPR _R^bV_RQ Of]N_NT_N]U #N\$#W\$ \S aUV` $GRPaV\setminus[*+$

_]b_]\^R`\S aUR `]RPYNY ZRRaV[T N[Q `bO`aN[aVNYYf aUR `NZR ZNaaR_`]_\]\^RQ a\ OR NPaRQ \[NauR `]RPYNY ZRRaV[T #V[RNPU PN`R N` QRaR_ZV[RQ V[T\\Q SNVaU Of aUR 6\N_Q\$\ N[Q #6\$ UN` ORR[QNaRQ N[Q QRYVcR_RQ a\ aUR GRP_RaN_f dVaUV[`Veaf #/)\$ QNf` \S aUR RN_YVR`a QNaR \S `bPU G]RPYNY ARRaV[T FR^bR`a`' =S aUR _RP_Q U\YQR_ V` [\a aUR `VT[Na_f a\ aUR G]RPYNY ARRaV[T FR^bR`a\ `bPU G]RPYNY ARRaV[T FR^bR`a dVYY [\a OR cNYVQ b[YR`` Q\PbZR[aN_f RcVQR[PR V` `b]]YVRQ a\ aUR GRP_RaN_f Na aUR aVZR \S QRYVcR_f \S `bPU G]RPYNY ARRaV[T FR^bR`a #_ dVaUV[aR[#*)\$ Ob`V[R`` QNf` aUR_RNSaR_\$ \S `bPU `VT[Na_fj` NbaU_Vaf a\ ReRPbaR aUR G]RPYNY ARRAV[T FR^bR`a \[ORUNYS \S aUR _RP_Q U\YQR_' 5 [f _R^bR`aV[T `a\PXU\YQR_ ZNf _Rc\XR UV`\ UR_ _ Va` G]RPVNY ARRAV[T FR^bR`a Na N[f aVZR Of d_VaaR[_Rc\PNaV\[QRYVcR_RQ a\ aUR GRP_RaN_f Na aUR]_V[PV]NY ReRPbaVcR \SSVPR` \S aUR 7_]_NaV\[4]_\cVQRQ\ U\dRcR\ aUNa VS S\YY\dV[T `bPU _Rc\PNaV\[#_ N[f QRRZRQ _Rc\PNaV\[]b_`bN[a a\]N_NT_N]U #O\$#VVV\$#6\$ aUV` \GRPaV\[*+\$\ aUN ER^bV\VaR DR_PR[a\ aUR_R\XRQ cNYVQ G]RPVNY ARRAV[T FR^bR`a` _R]_R`R[a V[aUR NTT_RTNAR YR` aUN[aUR FR^bV\VaR DR_PR[a\ aUR_R\XRQ cNYVQ G]RPVNY ARRAV[T FR^bR`a` P\[`aVabaV[T [\a YR` aUN[aUR FR^bV\VaR DR_PR[a\ aUNY] UNcR ORR[QRYVcR_RQ a\ aUR 7_]_NaV\[V` _RSR_RQ a\ UR_RV[N` aUR hFR^bR`a` FRPRV]a 8NaR'i

aUR $7 = AV = RRQ [a]_RR[a]_RR[a]_S = N_c RRaV[T]_aUNa RRAV [RRQ [A]_RRAV [T]_AV = RRAV [T]_AV = RR$

`a\PXU\YQR_`_ #6\\$ GRPaV\[*, \S aUV\ 5_a\PYR === d\VaU_R\]RPa a\ N[N[[bny ZRRaV[T\\ \UnivY OR] \[Yf `bPU Ob`V[R`` `UNYY OR P\[QbPaRQ Na N ZRRaV[T \S `a\PXU\YQR_` N` `UNYY UNCR ORR[O_\bTUa ORS\ R aUR ZRRaV[T V[NPP_QN[PR dVaU aUR]_\PRQb_R` `Ra S_aU V[aUV` $\underline{GRPaV\setminus[*+']}$ 9ePR]a N` $\auR_dV^R = \cVQRQ Of YNdW aUR PUNV_ \S aUR ZRRaV[T `UNYY UNCR aUR] \dR_ N[Q Qbaf #e$ a$ $QRaR_ZV[R\ dURaUR_N\ [\ ZV[NaV\ [\ \]_\]_\]^RQ\ a\ OR\ O_\ bTUa\ ORS\ R\ aUR\ ZRRaV[T\ dN^*]$ ZNQR _]_\]\`RQ\ N` aUR PN`R ZNf OR\ V[NPP_QN[PR dVaU aUR]_\PRQb_R` `Ra S_aU V[aUV` <u>GrPaV\ [</u> *+ #V[PYbQV[T dURaur_ aur `a\pxu\yqr_ _ OR[RSVPVNY \d[R_\ VS N[f\ \[dU\`R ORUNYS aur $[\ZV[NaV\] \] \] NY V ZNQR \YVPVaRQ #_ V]N_a \S N T_b] dUVPU \YVPVaRQ$ _ QVQ [\a \\]$ `\\YVP\Va\\ N` aUR PN`R ZNf OR\\]_\eVR` V[`b]]_a \S `bPU `a\\PXU\\YQR_j` [\Z\V[RR _]_\]\`N\\ V[P\Z]YVN[PR dVaU `bPU `a\PXU\YQR j` R] R`R[aNaV\[R^bV RQ b[QR]N NT N]U #0\$ \S aUV` GRPaV\[*+\$ N[O #f\$ VS N[f]_\]\`RQ [\ZV[NaV\[_ Ob`V[R`` dN` [\a ZNQR _]_\]\`RQ V[P\Z]YVN[PR dVaU aUV` GRPaV\[*+\| a\ QRPYN_R aUNa `bPU [\ZV[NaV\[`UNYY OR QV`_RTN_QRQ _ aUNa `bPU]_\]\`RQ Ob'V[R'' 'UNYY [\a OR a_N['NPaRQ' B\adVaU'aN[QV[T aUR $S\RT\V[T]\cV'V\[' \S aUV' GRPaV\[*+\W VS]$ $aUR `a\PXU\YQR_ dU `bOZVaaRQ N [\ZV[NaV\[_]_\] `RQ Ob`V[R`` #_ N ^bNYVSVRQ _R]_R`R[aNaVcR]$ \S aUR `a\PXU\YQR_\$ Q\R` [\a N]]RN_ Na aUR N[[bNY _ `]RPVNY ZRRaV[T \S `a\PXU\YQR_` \S aUR 7 = NaV = a = RRa = RR $N[Q \bPU]_{]\RQ Ob\V[R^` \UNYY [\a OR a_N[\NPaRQ\ [\ad VaU^aN[QV[T aUNa]_\eVR^ V[_R^]RPa \S]]$ `bPU ZNaaR_ ZNf UNCR ORR[RPRVcRQ Of aUR 7\]_NaV\[':_]b_]\`R`\S aUV` GRPaV\[*+ N[Q GRPaV\[*, \S 5 aVPYR ===% a\ OR P\[`VQR RQ N ^bNYVSVRQ R] R`R[aNaVcR \S aUR `a\PXU\YQR % N]R `\[Zb`a OR NbaU_VgRQ Of N d_VaV[T ReRPbaRQ Of `bPU `a\PXU\VQR_ _ N[RYRPa_\[VP a_N[`ZV``V\[QRYVcR_RQ Of `bPU `a\PXU\YQR_ a\ NPa S_ `bPU `a\PXU\YQR_ N`]_\ef Na aUR ZRRaV[T\S`a\PXU\YQR_` $\label{eq:continuous_problem} $$ N[Q `bPU]R_^\[Zb`a]_\QbPR `bPU d_VaV[T _RYRPa_\[VP a_N[`ZV``V\[\% _N _RYVNOYR _R]_\QbPaV\[E \] $$$ \S aUR d_VaV[T _ RYRPa_\ [VP a_N[`ZV``V\ [\\ Na aUR ZRRaV[T \S `a\PXU\YQR_`']

$GRPaV \setminus [*,'] D \setminus ef 5PPR \setminus S \setminus BV RPa \setminus B \setminus ZV[NaV \setminus [']']$

#N\$ $8 \text{RSV}[VaV \setminus ['' : \]b_] \setminus R' \setminus S \text{ aUV} GRPaV \setminus [*, \% \text{ aUR } S \setminus YY \setminus dV \mid T \text{ aR}_Z' \setminus UNYY UNCR aUR S \setminus YY \setminus dV \mid T ZRN[V \mid T']$

:_aUR Nc\VQN[PR\S Q\bOa% aUR]\cV`V\[`\S aUV` $\underline{GRPaV}\[*, ``UNYY\[\a N]\]Yf\ a\ N`]RPVNY ZRRaV[T \S `a\PXU\YQR_` #V[PYbQV[T% dVaU\ba YVZVaNaV\[% N Ga\PXU\YQR_ FR^bR`aRQ G]RPVNY ARRaV[T$% N[Q aUR 7_]_NaV\[`UNYY [\a OR _R^bV_RQ a\ V[PYbQR N QV_RPa_ [\ZV[RR\S N`a\PXU\YQR__ T_\b]\S `a\PXU\YQR_` V[aUR 7_]_NaV\[j`]\ef`aNaRZR[a_S_Z\S]_\ef_ONYY\a S_N[f`]RPVNY ZRRaV[T\S`a\PXU\YQR_`'$

#P\$ A NeVZbZ BbZOR \S Ga\PXU\YQR B\ZV[RR\'

#V\$ HUR $7 \setminus] \setminus NaV \setminus [`UNYY [A OR _R^bV_RQ a \setminus V[PYbQR V[aUR]_ef `aNaRZR[a S \ N[N[[bNY ZRRaV[T \$ `a \PXU \ YQR ` Z \ R Ga \ PXU \ YQR B \ ZV[RR` aUN [aUR A NeVZbZ] \]$

:_ aUR Nc\VQN[PR \S Q\bOa\ V[aUR RcR[a \S N [\ZV[NaV\[Of N B\ZV[Na_ ; _\b]\ N[f N[Q NYY _R^bV_RZR[a` N[Q \OYVTNaV\[` S_ N TVcR[9YVTVOYR Ga\PXU\YQR_ #V[PYbQV[T\ dVaU\ba YVZVaNaV\[\ RNPU N[Q RcR_f Sb[Q _ P\Z]N[f aUNa P\Z]_V`R` aUR B\ZV[Na_ ; _\b]\\$ aUNa N_R `Ra S_aU V[aUV` \\ \frac{GRPaV\[* \, \ V[PYbQV[T aUR ZV[VZbZ U\YQV[T]R_V\Q\ `UNYY N]]Yf a\ RNPU ZRZOR_ \S `bPU B\ZV[Na_ ; _\b]\\$ \\ \frac{1}{2}\cvVQRQ\ \U\dRcR\ aUNa aUR AV[VZbZ BbZOR_ `UNYY N]]Yf a\ aUR Cd[R_`UV]\\$ aUR B\ZV[Na_ ; _\b]\ V[aUR NTT_RTNaR' GU\bYQ N[f `a\PXU\YQR_ dVaUQ_Nd S_\Z N B\ZV[Na_ ; _\b]\ Na N[f aVZR]_V_ a\ aUR N[[bNY ZRRaV[T \S `a\PXU\YQR_`\ aUR B\ZV[Na_ ; _\b]\ `UNYY\ [Yf OR QRRZRQ a\ Cd[aUR `UN_R` URYQ Of aUR _RZNV[V[T ZRZOR_` \S aUNa B\ZV[Na_ ; _\b]'

#\V\\\$ B\ `a\PXU\\YQR_ `UN\YY OR]R_Z\VaaRQ a\ OR \V[Z_R aUN[\[R B\Z\V[Na_ ;_\b]\\ N[Q \VS N[f `a\PXU\\YQR_ N]]RN_` N` N \ ZRZOR_ \S \Z_R aUN[\[R B\Z\V[Na_ ;_\b]_N` N \ ZRZOR_ \S \N B\\Z\V[Na_ ;_\b] \N[Q \N` N B\\Z\V[Na\V[T Ga\PXU\\YQR_ d\VaU\\ba N[f `bPU T_\b]\\ `bPU `a\PXU\\YQR_ `UN\YY OR QRRZRQ a\ OR N \ ZRZOR_ \S \[Yf aUR B\Z\V[Na_ ;_\b] \aUNa UN` aURa a \ R_`UV]

]\`a]\[RZR[a \S N[N[[bNY ZRRaV[T\ _ aUR]bOYVP N[[\b[PRZR[a \S `bPU N[NQ\b_[ZR[a _]\`a]\[RZR[a\ P\ZZR[PR N [Rd aVZR]R_V\Q #_ ReaR[Q N[f aVZR]R_V\Q\ S_ aUR TVcV[T \S N B\ZV[NaV\[B\aVPR']

- #7\$ N QRaNVYRQ QR`P_V]aV\[\S NYY P\ZZb[VPNaV\[` Of `bPU B\ZV[NaV[T Ga\PXU\YQR_ dVaU N[f \aUR_ `a\PXU\YQR_ _ OR[RSVPVNY \d[R_ \S N[f `RPb_VaVR` \S aUR 7_]_NaV\[_RTN_QV[T `bPU Ga\PXU\YQR_ B\ZV[RR4
- #8\$ aUR QRaNVY` \S N[f _RYNaV\[`UV] aUNa ReV`aRQ dVaUV[aUR]N`a aU_RR fRN_` N[Q aUNa d\bYQ UNcR ORR[QR`P_VORQ]b_`bN[a a\ =aRZ /#R\$ \S GPURQbYR *-B #_ N[f `bPPR``_ VaRZ\$ VS Va ReV`aRQ \[aUR QNaR \S `bOZV``V\[\S aUR GPURQbYR *-B #_ N[f `bPPR``_ VaRZ\$4
- #9\$ N_R]_R^R[aNaV\[N[Q dN_N[af aUNa aUR B\ZV[NaV[T Ga\PXU\YQR_ QVQ [\a NP^bV_R% N[Q V^ [\a U\YQV[T% ^RPb_VaVR^ \S aUR 7_]_NaV\[S_ aUR]b_]\^R _ dVaU aUR RSSRPa \S V[SYbR[PV[T _ PUN[TV[T P\[a_\Y \S aUR 7_]_NaV\[4]]
 - #:\$ $N_R_R^R_aNaV\setminus N_Q dN_N_afaUNaaUR_B\setminus ZV_NaV_TGa\setminus PXU\setminus YQR_UN^*_A A_V_NaRQ_UN^*_A A_V_NARQ^UN^*_A A_V_NARQ^UN^*_A A_V_NARQ^UN^*_A A_V_NARQ^UN^*_A A_V_NARQ^UN^*_A A_V_NA$

`bPPR``_ VaRZ\$ b[QR_ aUR 9ePUN[TR 5Pa\ d\VaU\ba_RSR_R[PR a\ d\URaUR_ aUR RcR[a\V`\ZNaR_\VNY a\ N[RcNYbNaV\[\S aUR NO\YY\af\\ V[aRT_\Vaf\S aUR Ga\PXU\\YQR_ B\Z\V[RR4]

#@\$ N _R]_R`R[aNaV\[N[Q dN__N[af aUNa aUR B\ZV[NaV[T Ga\PXU\YQR_ `NaV`SVR` aUR RYVTVOVYVaf _R^bV_RZR[a` `Ra S_aU V[]N_NT_N]U #Q\$ \S aUV` GRPaV\[*,

- #:\$ $V[aUR RcR[a aUNa aUR B\ZV[NaV[T Ga\PXU\YQR_ #V[PYbQV[T N[f ZRZOR_ \S N B\ZV[Na_ ;_\b]$ UN` SNVYRQ a\ P\[aV[bR a\ `NaV`Sf aUR RYVTVOVYVaf _R^bV_RZR[a` QR`P_VORQ V[]N_NT_N]U #Q$ \S aUV` <math>GRPaV\[*, \]$ a\]_\Z]aYf [\aVSf aUR 7_]_NaV\[4 N[Q]

- #<\$ aUR Ga\PXU\YQR_ B\ZV[RR UN` ORR[% dVaUV[aUR]N`a aU_RR #,\$ fRN_% N[\SSVPR_ _ QV_RPa_ \S N P\Z]RaVa_% N` QRSV[RQ S_]b_]\`R` \S GRPaV\[1 #_ N[f`bPPR``_ aUR_R\S\$ \S aUR 7\Nfa\[5 [aVa_b`a 5 Pa \S *2*-% N` NZR[QRQ4 _
- #=\$ aUR B\ZV[NaV[T Ga\PXU\YQR_ UN` SNVYRQ a\ P\[aV[bR a\ `NaV`Sf aUR RYVTVOVYVaf _R^bV_RZR[a` QR`P_VORQ V[]N_NT_N]U #Q\$ \S aUV` $GRPaV\setminus [*, * N \text{ } N \text{ } f \text{ } S \text{ } aUR _R]_R`R[aNaV\setminus [` N \text{ } A \text{ } N \text$
- #5\$ `bPU $V[S\ZNaV\[V\[A a_bR\V[NYY\ZNaR_VNY_R\]RPa\\L\XVa\N\ZNaR_VNY\aNaRZR[a RPR\N_f a\ZNXR\aUR\aNaRZR[a\ZNXR\[A ZVYRNQV\[T4]]$
- #6\$ `bPU $V[S\ZNaV\[QV_RPaYf _ V[QV_RPaYf VZ]bT[` aUR PUN_NPaR_% V[aRT_Vaf _]R_`\[NY_R]baNaV\[\S% _ QV_RPaYf _ V[QV_RPaYf ZNXR` PUN_TR` P\[PR_[V[T VZ]_\]R_% VYYRTNY _ VZZ_NYP\[QbPa _ N``\PVNaV\[`% dVaU\ba SNPabNY S\b[QNaV\[% dVaU_R`]RPa a\% N[f V[QVcVQbNY% P_]_NaV\[%]N_a[R_`UV]% N``\PVNaV\[_ \aUR_ R[aVaf% _TN[VgNaV\[_ T\cR_[ZR[aNY NbaU_Vaf4]]]$
- #7\$ aUR $V[PYb^V | S^bPU V[S_ZNaV | V[aUR]_ef^aNaRZR[a d_bYQ aUR_dV^R cV_YNaR aUR GRPb_VaVR^N[Q 9ePUN[TR 7\ZZV^V |]_ef_bYR^ _ N[f_aUR_N]]YVPNOYR YNd%_bYR _ RTbYNaV \ [4 _$
- #8\$ aUR $V[PYb^V | S^bPU V[S_ZNaV | V[aUR]_ef^aNaRZR[a d bYQ VZ]^R N ZNaR_VNY_VX S YVNOVYVaf b] | aUR 7 | NaV | V$
- #Vc\$ HUR $7 \setminus NaV \in ZNf \ NTNV \ NTNV \ N[Q V[PYbQR V[aUR]_ef \ NaRZR[a Va \ d \ NaRZR[a _RYNaV \ T a \ N | f Ga \ PXU \ YQR_ B \ ZV \ [RR']$

`a\PXU\YQR_` #V[PYbQV[T N[f OR[RSVPVNY \d[R_`\$' HUR PUNV_ \S aUR ZRRaV[T `UNYY% VS aUR SNPa` dN_N[a% QRaR_ZV[R N[Q QRPYN_R a\ aUR ZRRaV[T aUNa N [\ZV[NaV\[dN` [\a ZNQR V[NPP_QN[PR dVau aUR S_RT\V[T]_\PRQb_R^% N[Q aUR QRSRPaVcR [\ZV[NaV\[`UNYY OR QV`_RTN_QRQ'

#V\$ $9ePYb^VcR ARaU \setminus Q' HUV^CR ARaU \setminus Q' HUV^CR ARaU \setminus Q' HUV^CR ARaU \setminus Q S \setminus a \setminus V[PYbQR [\ ZV[RR^C S \setminus QV_RPa \setminus V[aUR 7 \setminus] \setminus NaV \setminus [j^C]]_ \setminus ef ZNaR_VNY^KRePR] a \ a \ aUR ReaR[a R^bV RQ Of FbYR *-N&*2 b[QR aUR 9ePUN[TR 5Pa'] \ AUR ReaR[a R^bV RQ Of FbYR *-N&*2 b[QR aUR 9ePUN[TR 5Pa'] \ AUR PRODUCT | A$

 $GRPaV \setminus [*-'] \frac{7 \setminus [DbPa] \setminus S \setminus ARRaV[T^*] + HUR 7UNV_ \setminus S \setminus AUR 6 \setminus_Q \text{`UNYY NPa N^* PUNV_ } }{ZRRaV[T^* \setminus S \hat{} \text{`a} \setminus YUV \setminus_YQR_*^* \setminus S \setminus_AUR 7 \setminus_] \setminus_NaV \setminus_[* b[YR^*] \setminus_AUR_dV^*R QRaR_ZV[RQ Of aUR 6 \setminus_Q'] + HUR 6 \setminus_Q ZNf NQ \mid_a Of _R^* \setminus_baV \setminus_[* bPU _bYR^* N[Q _RTbYNaV \setminus_[* S \setminus_aUR P \setminus_QbPa \setminus_S \setminus_AUR ZRRaV[T \setminus_S \hat{} \text{`a} \setminus_YUV \setminus_YQR_*^* N^* Va ^* UNYY QRRZ N]]_ \setminus_JVNaR' 9ePR]a a \setminus_aUR ReaR[a V[P \setminus_V^* aR[a dVaU ^* bPU _bYR^* N[Q _RTbYNaV \setminus_[* N^* NQ \setminus_aUR BR_*^* \setminus_J] + NQV \setminus_JVR_*^* V_JVY \setminus_JVNAR' 1 - NQV \setminus_JVR_*^* V_JVY \setminus_JVNAR' 1 - NQV \setminus_JVR_*^* V_JVY \setminus_JVYY \setminus_JVYY \setminus_JVNAR AV \setminus_JVAR_*^* N_JV \setminus_JVYY \setminus_JVYY \setminus_JVNAR AV \setminus_JVAR_*^* N_JV \setminus_JVYY \setminus_JVNAR AV \setminus_JVAR_*^* N_JV \setminus_JVNAR AV \setminus_JVAR_*^* N_JVAR_*^* N_JV \setminus_JVNAR AV \setminus_JVAR_*^* N_JVAR_*^* N_J$

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#U\$ V[aR[Q` a\ `R_cR N SbYY aR_Z VS RYRPaRQ N` N QV_RPa_ \S aUR 7_]_NaV\[% N[Q #V\$ dVYY]_\cVQR SNPa`% `aNaRZR[a` N[Q \aUR_ V[S_ZNaV\[V[NYY P\ZZb[VPNaV\[` dVaU aUR 7_]_NaV\[N[Q Va` `a\PXU\YQR_` aUNa N_R _ dVYY OR a_bR N[Q P_RPa V[NYY ZNaR_VNY _R`]RPa`% N[Q aUNa Q\ [\a N[Q dVYY [\a \ZVa a\ `aNaR N ZNaR_VNY SNPa [RPR``N_f V[_QR_ a\ ZNXR aUR `aNaRZR[a` ZNQR% V[YVTUa \S aUR PV PbZ`aN[PR` b[QR dUVPU aURf N R ZNQR% [\a ZV`YRNQV[T'

 $GRPaV \setminus [, ' \underline{9YRPaV \setminus [4 \ FR^VT[NaV \setminus [' \ 5 \ a \ RNPU \ N[[bNY \ ZRRaV[T \setminus S \ a \setminus PXU \setminus YQR_` \ aUR \ a \setminus PXU \setminus YQR_` \ UNYY \ RYRPa \ QV_RPa \setminus [\ RNPU \setminus S \ dU \setminus Z \ UNYY \ U \setminus Q \ SSVPR \ S \setminus [R \ fRN_ \setminus b [aVY \ UV \setminus UR_ \ bPPR^` \setminus V \ QbYf \ RYRPaRQ \ N[Q \ bNYVSVRQ \ bOWRPa \ a \setminus bPU \ QV_RPa \setminus j \ RN_YVR_ \ QRNaU \ R^VT[NaV \setminus [\ QV^bNYVSVPNaV \setminus [\ RZ \setminus cNY'] \ NUV \ NU$

9NPU QV_RPa_`UNYY OR RYRPaRQ Of aUR c\aR\S aUR ZNW_Vaf\S aUR c\aR`PN`a dVaU_R`]RPa a\aUR QV_RPa_ Na N[f ZRRaV[T S_ aUR RYRPaV\[\S QV_RPa_` Na dUVPU N ^b_bZ V`]_R`R[a Of aUR U\YQR_`\S`UN_R`]_R`R[a V[]R_`\[__R]_R`R[aRQ Of]_\ef N[Q R[aVaYRQ a\ c\aR\ [aUR RYRPaV\[\S QV_RPa_`^4]_\cvQRQ\ aUNa\ aUR QV_RPa_``UNYY OR RYRPaRQ Of aUR c\aR\S N]Yb_NYVaf\S aUR `UN_R` R]_R`R[aRQ V[]R_`\[_ Of]_\ef Na N[f `bPU ZRRaV[T N[Q R[aVaYRQ a\ c\aR\ [aUR RYRPaV\[\S QV_RPa_`^5 \] N[f ZRRaV[T S_ aUR RYRPaV\[\S QV_RPa_`^5 \] dUVPU #N\$ aUR GRP_RaN_f _RPRVcR` N [\aVPR aUNa N `a\PXU\YQR_ UN` [\ZV[NaRQ \[R _ Z_R PN[QVQNaR` S_ RYRPaV\[a\ aUR 6\N_Q V[P\Z]YVN[PR dVaU aUR _R^bV_RZR[a` ` Ra S_aU V[aUR`R 6fYNd`\ N[Q #0\$ `bPU [\ZV[NaV\[UN` [\a fRa ORR[dVaUQ_Nd[Of `bPU `a\PXU\YQR_ \[_]_\v_ a\ aUR aR[aU #*)aU\$ QNf]_RPRQV[T aUR QNAR aUNa aUR 7_]_NaV\[SV_`a ZNVY` Va` [\aVPR \S ZRRaV[T S_ `bPU RYRPaV\[': _]b_]\`R` \S aUV` GRPaV\[\\ N ZNW_Vaf\ S aUR c\aR` PN`a ZRN[` aUNa aUR [bZOR_ \S `UN_R` c\aRQ hS_i N QV_RPa_]\$ RYRPaV\[' J\aR` PN`a `UNYY V[PYbQR c\aR` a\ dVaUU\YQ NbaU_Vaf N[Q RePYbQR NO`aR[aV\[`dVaU _R`]RPa a\ aUNa QV_RPa_j` RYRPaV\[' J\aR` PN`a `UNYY V[PYbQR c\aR` a\ dVaUU\YQ NbaU_Vaf N[Q RePYbQR NO`aR[aV\[`dVaU _R`]RPa a\ aUNa QV_RPa_j` RYRPaV\[' = SQV_RPa_` N_R a\ OR RYRPaRQ Of N]Yb_NYVaf\ `a\ PXU\YQR_` `UNYY OR]R_ZVaaRQ a\ dVaUU\YQ c\aR` S_\Z N [\ZV[RR Oba `UNYY [\a OR]R_ZVaaRQ a\ c\aR NTNV[`a N [\ZV[RR')]RR'

 $5 \ [f \ QV_RPa \setminus ZNf _R`VT[\ Na \ N[f \ aVZR \ b] \setminus [\ [\setminus aVPR \ a \setminus \ aUR \ 6 \setminus N_Q' = S \ Na \ N[f \ ZRRaV[T \ S \setminus \ aUR \ RVRPaV \setminus [\ \setminus S \ QV_RPa \setminus \ N \ [\setminus ZV[RR \ S \setminus \ QV_RPa \setminus \ dU \setminus \ V` \ N[\ V[PbZOR[a \ QV_RPa \setminus \ V` \ [\setminus a \ RVRPaRQ \ N[Q \ [\setminus \ AVRPaRQ \ N[Q \] \setminus \ AVRPaRQ \ N[Q \] \setminus \ AVRPaRQ \ N[Q \ [\setminus \ AVRPaRQ \ N[Q \] \setminus \ AVRPARQ \ N[Q \$

 $7 \ Z Z \ VaaRR \ UNCR \ aR[QR_RQ \ aURV_ \ SSR_^ \ S \ _R^VT[NaV \ [\ aUR[\ aUR[\ aUR \ 6 \ N_Q \ VNYY \ NPa \ [\ aUR \ SSR_^ \ SR_^ \ VT[NaV \ [\ aUR[\ aUR \ AVR_ \ AVR_ \ NPa \ NPa$

 $HUR 6 \ N_Q \ `UNYY \ NPa \ [\ aUR \ aR[QR_RQ \ SSR_` \ S \ R^VT[NaV \ [\ aNXV[T \ V[a \ NPP \ b[a \ aUR \ RP \ ZZR[QNaV \ [\ S \ aUR \ B \ ZV[NaV[T \ N[Q \ ; \ cR_[N[PR \ 7 \ ZZVaaRR \ N[Q \ `UNYY \] bOYVPYf \ QV^PY \ R \ \#Of \]_R^* \ RYRN^R \ N \ SVYV[T \ dVaU \ aUR \ GRPb_VaVR \ N[Q \ 9ePUN[TR \ 7 \ ZZV^*V \ [\ _ \ aUR \ O_NQYf \ QV^*RZV[NaRQ \ ZRN[` \ S \ P \ ZZb[VPNaV \ [\ Va \ QRPV^V \ [\ _RTN_QV[T \ aUR \ aR[QR_RQ \ SSR_` \ S \ _R^VT[NaV \ [\ NY \ S \ aUR \ RRPaRQ \ aUR \ _NaV \ [NYR \ ORUV[Q \ aUR \ QRPV^V \ [\ dVaUV[\ 2) \ QNf \ S_Z \ aUR \ QNaR \ S \ aUR \ PR_aVSVPNaV \ [\ S \ aUR \ RYRPaV \ [\ _R^*bYa^* = [\ QRaR_ZV[V[T \ dURaUR_a \ NPPR]a \ _ RWRPa \ N[f \ SSR_ \ S \ _R^VT[NaV \ [\ S \ aUR \ SNPa \] \ P \ [\ VQR_RQ \ Of \ aUR \ B \ ZV[NaV[T \ N[Q \ ; \ cR_[N[PR \ 7 \ ZZVaaRR \ N[Q \ N[f \ NQQVaV \ NYY \ S \ aUR \ SNPa \] \ P \ [\ VQR_RQ \ Of \ aUR \ 6 \ N_Q \ SNYY \ S \ aUR \ 6 \ N_Q \ CRPV^V \ [\ B \ a \ dVaU^a \ an[QV[T \ aUR \ S \ R^VT[TNaV \ [\ AUR \ 7 \] \ NPPR]aN[PR \ Of \ aUR \ 6 \ N_Q \ SNYY \ S \ aUR \ AUR[\]R[QV[T \ SSR_` \ S \ R^VT[NaV \ [\ d \ bYQ \ R^*bYa \ V[\ aUR \ 7 \] \ NAV \ [\ UNcV[T \ SRd_aUN[\ aUR \ 6 \ N_Q \ NYY \ S \ aUR \ 6 \ N_Q \ SNY \ S \ AUR \ 6 \ N_Q \ SNY \ S \ SUR \ 6 \ N_Q \ SNY \ S \ AUR \ 6 \ N_Q \ SNY \ S \ AUR \ 6 \ N_Q \ SNY \ S \ SUR \ 6 \ N_Q \ SNY \ S \ SUR \ 6 \ N_Q \ SNY \ S \ SUR \ 6 \ N_Q \ SNY \ S \ SUR \ 6 \ N_Q \ SNY \ S \ SUR \ 6 \ N_Q \ SNY \ S \ SUR \ 6 \ N_Q$

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- $GRPaV \setminus [*)' \qquad \underline{C \ TN[VgNaV \setminus [' \ ARRaV[T^ \setminus S \ aUR \ 6 \setminus N_Q \ VNYY \ OR \]_R^VQRQ \setminus cR_Of \ aUR \ 7 \ UNV_ \setminus S \ aUR \ 6 \setminus N_Q WS \ N[f \ \ V[UV^ \setminus UR_NO^R[PR \ Of \ aUR \ D_R^VQR[a \ \ V[aURV_NO^R[PR \ Of \ N \ PUNV_PU\^R[Na \ aUR \ ZRRaV[T' \ HUR \ GRP_RaN_f \ VNYY \ NPa \ N^ \ RP_RaN_f \setminus S \ aUR \ ZRRaV[T \ Oba \ V[UV^ \setminus UR_NO^R[PR \ aUR \ PUNV_ \setminus S \ aUR \ ZRRaV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ aUR \ ZRRaV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ aUR \ ZRRaV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ ZRRaV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ ZRRaV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ ZRRaV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RAV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RAV[T' \ NPa \ N^ \ RAV[T' \ NPa \ N^ \ RP_RaN_f \setminus S \ AUR \ RAV[T' \ NPa \ N^ \ RAV[$
- $GRPaV \setminus [*+' \quad \frac{7}{Z}]R[`NaV \setminus [\ \ \ 8V \ RPa \setminus \ \ '] \ HUR \ 8V_RPa \setminus \ \ ZNf \ OR \]NVQ \ aURV_Re]R[`R`W \ VSN[fW S \setminus \ NaaR[QN[PR Na \ RNPU \ ZRRaV[T \setminus S \ aUR \ 6 \setminus N_Q \ N[Q \ N^NQ \ N[Q \ ZNf \ OR \]NVQ \ N SVeRQ `bZ S \setminus \ NaaR[QN[PR Na \ RNPU \ ZRRaV[T \setminus S \ aUR \ 6 \setminus N_Q \ N[Q \ N \ `aNaRQ \ `NYN_f \ N` \ 8V_RPa \setminus \ ' \ ARZOR_` \ S `]RPVNY \setminus \ `aN[QV[T \ P \setminus ZZVaaRR \ ZRRaV[T` B \setminus \ `bPU \]NfZR[a `UNYY]_RPYbQR \ N[f \ 8V_RPa \setminus \ S \setminus Z \ `R_cV[T \ aUR \ 7 \setminus \] \setminus NaV \setminus [V[N[f \ aUR_PN]NPVaf \ N[Q \ RPRVcV[T P \setminus Z]R[`NaV \setminus [aUR_RS \setminus \ '] \ NaV \setminus [aUR_RS \setminus \ ']$
- $GRPaV \ [*,' \ \ \frac{7UNV}{S} \ aUR \ 6\ NQ' \ HUR \ 7UNV_ \ S \ aUR \ 6\ NQ \ `UNYY \ OR \ PU\ `R[S_X \ NZ\ [Taur QV_RPa_` N[Q ZNf OR aUR 7UVRS 9eRPbaVcR CSSVPR_' HUR 7UNV_ \ S aUR 6 \ N_Q \ `UNYY]_R` VQR Na NYY ZRRaV [T` \ S aUR `a\PXU\YQR_` N[Q aUR 6 \ N_Q' HUR 7UNV_ \ S aUR 6 \ N_Q `UNYY UNCR `bPU \ aUR_] \ dR_` N[Q QbaVR` N` ZNf S_X aV ZR a\ aVZR OR N`` VT [RQ Of aUR 6 \ N_Q' \ N_Q' \ N^2 \ N^2$

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 $GRPaV \setminus [+' \quad \underline{9eRPbaV \setminus [\setminus S 7 \setminus [a NPa^{'}] \text{ } HUR 6 \setminus N_Q \text{ } ZNf \text{ } NbaU \setminus \underline{VgR} \text{ } N[f \setminus SSVPR_^ \setminus \underline{NTR}[a \setminus \underline{N$

`UNYY OR N`aNaR P\b_a Y\PNaRQ dVaUV[aUR GaNaR \S 8RYNdN_R #_\ VS [\`aNaR P\b_a Y\PNaRQ dVaUV[aUR GaNaR \S 8RYNdN_R UN` Wb_V`QVPaV\[\ aUR SRQR_NY P\b_a S_ aUR 8V`a_VPa \S 8RYNdN_R\$'

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GRPaV\[*' $DR_{i} dU dN \ ZNQR \ V aU_RNaR[RQ a OR ZNQR N]N_af a \ U \ aUR_dV R V[c \ V]R [f]$ NPaV\[\"\`bVa_]_\PRRQV[T\" dURaUR_PVcVY\\ P_VZV[NY\\ NQZV[V`a_NaVcR_V[cR`aVTNaVcR \\ \UR_RV[NSaR_N $h]_\PRRQV[Ti$M Of _RN^[\ SNPa aUNa UR _ `URM _ N]R_^[\ S dU \ Z UR _ `UR V` aUR YRTNY]$ _R]_R`R[aNaVcR\V`_ dN`N 8V_RPa_ _ \SSVPR_ \S aUR 7_]_NaV\[_ dUVYR N 8V_RPa_ _ \SSVPR_ \S aUR $7 = NaV = V - dN^ R_cV = Na = AN - R^bR^a S = AV = NaV = N^ N = AV = N^ N = N^ N = AV = N^ N = A$ $R[aR_]_V^R \setminus [\ [\&]_\SVa\ R[aVaf\%\ V[PYbQV[T^R_cVPR\ dVaU_R]RPa\ a\ RZ]Y\ fRR\ OR[RSVa\]YN[^%^UNYY\ OR$ V[QRZ[VSVRQ N[Q URYQ UN_ZYR`` Of aUR 7_]_NaV\[a\ aUR SbYYR`a ReaR[a]R_ZVaaRQ Of aUR YN d\ N` aUR `NZR ReV`a` _ ZNf UR_RNSaR_ OR NZR[QRQ\\NTNV[`a NYY YVNOVYVaf N[Q Y\`` `bSSR_RQ N[Q Re]R[`R` $\#V[PYbQV[T Naa \ [Rf] SRR^{\ NN' \ NOYf \ V[Pb_RQ Of `bPU 7 \ cR_RQ DR_' \ ' B \ a d VaU`aN[QV[T aUR] B \ a d VaU`aN[QV$]_RPRQV[T `R[aR[PR\ RePR]a N` \aUR_d\'R]_\c\\QRQ \V[aU\'\ 5 \a\\PYR \=\L\\ \aUR_7_]_\N\\\[`UNYY $V[QRZ[VSf N 7 cR_RQ DR_' | V[P|[RPaV| dVaU N]_\PRRQV[T #] N_a aUR_R SV[VaVNaRQ Of bPU]$

 $GRPaV \setminus [+'] DR]NfZR[a \setminus SPe]R[\hat{R}'] + HUR 7 \setminus] \setminus NaV \setminus [\hat{UNYY}] a AuR SbYYR a ReaR[a [\setminus a]] \setminus UVOVaRQ Of N]]YVPNOYR YNd]Nf aUR Re]R[\hat{R}'] + W[PYbQV[T Naa \setminus [Rf'j SRR'] V[Pb_RQ Of N 7 \setminus R_RQ DR_' \setminus [V[QRSR[QV[T N[f]] \setminus PRRQV[T V[NQcN[PR \setminus SVa'] SV[NY QV']] \setminus VaV \setminus [4] \setminus CVQRQM U \setminus dRcR_M aUNaM a \setminus aUR ReaR[a_R^bV_RQ Of YNdM'bPU]NfZR[a \setminus SRe]R[\hat{R}'] + V[NQcN[PR \setminus SUR SV[NY QV']] \setminus VaV \setminus [NQcN[PR \setminus SUR SV[NY QV']] \setminus VaV \setminus [NQcN[PR \setminus SUR SV[NY QV']] \setminus VaV \setminus [NQcN[PRQV[T NUYY OR ZNQR \setminus [Yf b]] + [NPRQV[T NUYY OR ZNQR \setminus [Yf b]] + [NPRQV[T NUYY OR ZNQR NUY OR BYAVZNARY OR NUV OR BYAVZNARY OR AUNA AUR 7 \setminus CR_RQ DR_' \setminus [NY NZ \setminus SUR SV[NY QV']] + [NY NZ NZ SUR SV[NY QV']] + [NY NZ \setminus SUR SV[NY QV']] + [NY NZ NZ SUR SV[NY QV']] + [$

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- #N\$ $5 [f QV_RPa \setminus \ \ ReRPbaVcR \ SSVPR_ \ auR 7 \setminus] \setminus NaV \setminus [ZNf PNYY N ZRRaV[T \setminus S auR 6 \setminus N_Q \setminus N[f PN Z ZVaaRR auR_R \setminus S Of N[f SRN VOYR ZRN[N[Q dVau `bPU NQcN[PR [\ aVPR N ` PV_PbZ`aN[PR] R_ZVa V[aUR WbQTZR[a \ S auR] R_ \ [PNYYV[T auR ZRRaV[T' BRVauR_auR Ob`V[R` a\ OR a_N[`NPaRQ [\ aUR]b_] \ R\ S N[f `bPU ZRRaV[T [RRQ OR `] RPVSVRQ V[auR [\ aVPR aUR_R \ S'] RPVSVRQ V[auR] RPVSVRQ V[auR] RPVSVRQ V[auR] RPVSVRQ V[auR_R \ S'] RPVSVRQ$
- #P\$ $8V_RPa_{ \ N} = NRV_{ aNXR NPaV} [a N] V[a \ R \ Z\ R \ aUR QV_RPa_ a \ ZRZOR_`UV] \ [N[f `aN[QV[T \ aRZ] \ P \ Z Z VaaRR \ S aUR 6 \ N_Q N ` aUR G QRZ NQcV`NOYR' 8V_RPa_` ZNf NY` \ aNXR NPaV [a \ QR`VT[NaR \ R \ Z \ R \ S aUR \ SSVPR_` \ S aUR 7 \] _NaV \ [a \ R_cR N` QV_RPa_` \ S aUR 7 \] _NaV \ [d UVYR aUV` \ 5 aVPYR L = N] YVR`'$
- #Q\$ H\ aUR ReaR[a aUNa Va P\[`VQR_` Va]_NPaVPNY a\ Q\ `\% aUR 6\N_Q `UNYY ZN[NTR aUR Ob`V[R`` \\$ aUR 7_]_NaV\[Qb_V[T N[RZR_TR[Pf V[N ZN[[R_ aUNa V` P\[`V`aR[a dVaU aUR 7R_aVSVPNaR \\$ =[P_]_NaV\[N[Q aUR`R 6fYNd`' =a V` _RP\T[VgRQ% U\ dRcR_% aUNa V[N[RZR_TR[Pf% Va ZNf [\a NYdNf` OR]_NPaVPNY a\ NPa V[aUV` ZN[[R_ N[Q aUV` 5 aVPYR_L= V` V[aR[QRQ a\% N[Q Q\R` UR_ROf% RZ]\ dR_ aUR 6\N_Q dVaU aUR ZNeVZbZ NbaU_Vaf]\``VOYR b[QR_ aUR 8; 7@ N[Q NYY \aUR_N]]YVPNOYR YNd a\ P\[QbPa aUR V[aR_VZ ZN[NTRZR[a \\$ aUR NSSNV_` \\$ aUR 7_]_NaV\[V[N[

#V\$ B\aUV[T P\[aNV[RQ V[aUV\ $\underline{5}$ aVPYR \underline{L} = `UNYY OR QRRZRQ RePYb\VcR \S N[f\aUR_]_\cV\V\[\` S_ RZR_TR[Pf]\dR_\` P\[\V\aR[a dVaU \aUR_ `RPaV\[\` \S aUR 8; 7@ aUNa UNcR ORR[_ ZNf OR NQ\]aRQ Of P_]_NaV\[\` P_RNaRQ b[QR_ aUR 8; 7@'

 $HUR`R\ 6\ fYN\ d`\ ZNf\ OR\ NYaR_RQ\%\ NZR[QRQ\ \ _R]RNYRQ\%\ N[Q\ [R\ d\ O\ fYN\ d`\ ZNQR\%\ N`\ NbaU\ \ _VgRQ\ b[QR_\ N]]YVPNOYR\ YN\ d'$

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