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 $\label{eq:constraint} U39P28893!R4AA23A<7!8<4D!E2!K9>?D!F22I!E48!32I935!B342P!89!<8!59!=2D2!89A2!54A2!59!-30!"<?A:!KE9!K48E2D!59!8I2<F!<B9>5!5E2!>I=9A470!B>4?D470!<7D!32796<5497!I3972=58!97!% $"L)<??>I[8!=<AI>80!!!!$

 $\label{eq:1} U39P28893!R4AA23A<7!5E27!32A47D2D!P<=>?5@!9P!5E2!>I=9A47O!+882AB?@!2?2=54978(!&E2!P47<?!D<@!P93!5E2!79A47<54978!48!72H5!M2D728D<@:!5E2!\V"#:!<5!]!U " (!&E2@!=<7!B2!8275!59! - 30! (59720! - 30! - @23:!93! - 30! ">5E<4@<7:!<??!A2AB238!9P!5E2!$9A47<54978!*9AA455220!N2!=<>54972D!+882AB?@!A2AB238!59!A<F2!8>32!5E2@!E<62!5E2!=978275!$

?9 = <?! < D64893 @ !B9 < 3D (! & E2! * * & ' !P <= 4?45428 !722D !59 !B2! > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D! < 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 7D !32I ? <= 2D (! + 5!5E48 !I9475 :!E2!8E < 32D!) > IO3 < D2D! < 3D !32 !I ? <= 3D !3

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- 30! , SI2G! < 7D! - 30! R23 < 4!72H5! I3282752D! < !8?4D2! K45E! 2H < AI?28!9P! A4=39 < CO32884978: !<?970! K45E! K < @8!59! 475236272! 47!5E2A: !<7D! < 8F2D! P <= >?5@!59!52??! 5E243! 85 > D2758! < B9 > 5!5E2! 8 > 362@(!&E2! 85 > D2758! KE9! K232! 82?2=52D! P93! 5E2! 8 < AI?2! 8E9 > ?D! B2! 27 = 9 > 3 < CO2D! 59! = 9 AI?252! 450! #7!5E2! P < ??! : !5E2@! 47527D! 59! E < 62! P = > 8! CO39 > I8! K93F470! 97! 5E2! D < 5 < !P39 A! 5E2! 8 > 362@(!!47 = ?>D470! = 32 < 5470! < !8

 $<7D!<!, <547H!; <=>?5@!+??4<7=2!E<8!B227!32=275?@!?<7=E2D(!-30!R23<4!K4??!?2<D!<!D48=>88497!47!+I34?!97! O255470!47!59>=E!K45E!.#UT*!P<=>?5@!47!@9>3!D2I<35A275(!&E232!E<8!<?89!B227!<!I39Z2=5!D972!B@!<7!>7D23O3<D><52!85>D275!97!O272<?9O@!47!=>334=>?>A:!I328275470!<!?485!9P!=9>3828!97!3<=2:!89=4<?!Z>854=2:!<<7D!32?<52D!59I4=8!5<>OE5!847=2!5E2!VW \Y8!47!89=4<?!E=427=28!<7D!E>A<7454280!$

 $+7!+882AB?@!A2AB23!5E27!<8F2D!<B9>5!5E2!D2=?472!47!#7D40279>8!2739?!A275!D>2!59!*Tf#-!I<7D2A4=! 2PP2=58:!<7D!K93342D!5E<5!K2!A<@!795!E<62!<7!2<8@!32=9623@!P39A!5E480!N9K!K4??!% $"!E2?I!85>D2758!47! A<3047<?4G2D!<32<8!59!278>32!5E2@!8>==22Di!-30!R23<4!8<4D!5E<5!8E2!E<8!5E9>0E5!84A4?<3?@!<B9>5!85>D2758! KE9!K4??!B2!53<7845497470!59!=2753<?!=<AI>8:!<7D!KE9!E<62!?985!<!@2<30!&E232!48!<!B34D02!I3903<A!5E<5! +A234=<7!#7D4<7!(5>D275!(2364=28!930<74G280!&E232!<32!<?89!I3903<A8!B2470!D48=>882D!59!E2?I!85>D2758! K45E!?985!=32D45!E9>38:!59!8>II935!5E2A!47!5E2!P4385!@2<319P!=9A470!B<=F:!25=0:!B>5!5E2@!E<62!795!@25!B227! P47<?4G2D0!+??!47!<??!% $"!A>85!<DD3288!5E2!^>285497!9P!K2!K4??!D9!=9??2=5462?@!59!8>II935!85>D2758! A5E:P382!S232.549780!-30!, SI2G!<DD2D!5E<5!4752382=5497<?45@!48!B2470!>82D!<8!<!599?!59!A<I!KE9!48!795!=9A470! B<=F:!8>=E!<8!47628540<5470!KE25E23!45!48!53>2!5E<5!+A234=<7!#7D4<7!K9A27!KE9!<32!P4385L027!85>D2758! <32!795!=9A470!B<=F!<8!47628540<5470!KE25E23!45!48!53>2!5E<5!+A234=<7!#7D4<7!K9A27!KE9!<32!P4385L027!85>D2758! <32!795!=9A470!B<=F!<8!47628540<70!KE25E23!45!48!53>2!5E<5!+A234=<7!#7D4<7!K9A27!KE9!<32!P4385L027!85>D2758! <32!795!=9A470!B<=F!<8!599?!59!A<I!KE9!4385L027!85>D2758! <32!795!=9A470!B<=F!<8!599?!59!A<I!KE9!<9>82E9?D0! U39P28893!R4AA23A<7!=97P43A2D!5E<5!5E232!E<8!B227!<!D39I!47!#7D40279>8!2739?!A275!<5!% "L)<??>I0! !$

 $+8!5E2!I328275 < 5497!E < D!32 <= E2D!5E2!?4A45!9P!458!54A2:!5E2! + 882AB?@!5E < 7F2D! - 30!R23 < 4! < 7D! - 30!, SI2G!P93! \\ 5E243!47P93A < 5497:! < 7D!5E2!0 > 2858! < 7D!5E2!2H2 = >5462!52 < A!?2P50! \\ \\ \label{eq:sigma}$

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F\$. A0#\$*''&*\$*''1-\$/AD F\$. A497F41521Tf[3 . 6 0 0 462 0 29 . 646-1161Tr/nTT41Tf[!)T1Tf[(B@ !)-1(5)-1(]

F\$. A0#\$*A\$&PP4A0#\$*''#\$%A4 . \$E\$BA4\$*''#\$D#)#*1A2\$AB\$*''#\$, () , (\$12\$E41 . 12&)\$C(-*1'#\$EA44#'*1A2-(\$ \$ 0 A*1A2:\$*<39?@7!1>=E23<! M#'A2D#D:\$/28! L1-'(--1A2:\$\$972! HA*#0!%7<74A9>8! 0 A*1A2\$E&441#D0!/28!

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722D!5E322!59!P462!72K!P<=>?5@!59!82362!97!45!<8!82623<?!A2AB238!E<62!32<=E2D!5E2!?4A45!9P!5E243!523A:!<<7D!47!I<354=>?<3!K4??!

 $\begin{array}{l} U39P28893! - E45<?!<8F2D!4P!<7@972!F72K!KE<5!6<==47<5497!262758!A40E5!B2!E<II27470!5E48!K22F27D0!\\ U39P28893!R4AA23A<7!8<4D!59!=E2=F!47!K45E! " 30! , 22! , <AB:!KE9!P32^>275?@!827D8!9>5!5E48!47P93A<54970!\\ - 30! ' GG2??!8<4D!5E<5!J " *N!I9858!5E243! *T f# - !6<==47<5497!=?474=!54A28!<7D!D<528!97!5E243! ; <=2B99F!\\ I<020! + 7D!U39P28893! " >5E<4@<7!<DD2D!5E<5!<??!E40E23!2D>=<5497!2AI?9@228!<32!79K!2?404B?2!P93!5E2!\\ 6<==4720! \end{array}$

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