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! "#$%" &' (')*+#), -+)" . (&. '(/&)#. 0**1(23)%" *" 234(' 02&#+50. +6(
J = 7 = (@8AB78CDB8E91(CDB(EF(BK = (=FF = : B8L = (@8AB78CDB8E9(EF(<?CE7(?8J = @(?B(BK = (=FF = : B8L = (@8AB78CDB8E9(EF(<?CE7(?8J = @(?B(BK = (=FF = : B8L = (=FF = : B8
F7D8BFD4?9@(:7=?B8L=(@=L=4E; J=9B(EF(CEBK(F?:D4BI(?9@(ABD@=9BA1()))))))
D9@=7M7?@D?B=(?9@(M7?@D?B=6()9(AE(@E89M1(?(F?87(@8AB78CDB8E9(EF(BK=(
GE7H \leftarrow ?@(8A(?8J = @(?B(FD \leftarrow 8 \leftarrow 9M(BK = (F8@D: 8?71(EC \leftarrow 8M?B8E9A(?9@(J 8AA8E9(EF(B) = 0.871)EC \leftarrow 8M?B8E9A(?9)EC \leftarrow 8M?B
BK = (' = ?7BJ = 9B(89(A = 7L89M(BK = (N = AD8B(O?BKE - 48: (J 8AA8E - 9E)(EF(BK = (-98L = 7A8B + 16))))))
2789:8: ?48: : 48: ?88E9(EF(BK=(2789:8: \Leftarrow(EF(/?879=AA)))))
OL=71(F?:DBI(J=JC=7(;EAA=AA=A(BKEA=(A;=:8?4PD?8B8=A(EF(J89@(?9@(
@8A:8; 49=(BK?B(=9?C\Leftarrow A(K8J)QK=7(BE(?@L?9:=(H9EG\Leftarrow@M=(89(BK=87(7=\Leftarrow L?9B(
A : = : 8? + 88 = A(?9@(ADCA) : = : 8? + 88 = A(89(2K8 + EAE) : KI(?9@((AE(BE(B=? : K(CEBK)) + EAE) : KI(?9@(AE(BE(B=? : K(CEBK)) + EAE) : KI(AE(AE) + EAE) : KI(
D9@=7M7?@D?B=(?9@(M7?@D?B=(ABD@=9BA(?B(BK=(K8MK=AB(<=L=\langle EF(=R;=7B8A=(ABD@=9BA(RBK=AB(RBK=A
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=9K?9:89M(BK=(89B=\ll=:BD?4\&F=(EF(BK=(-98L=7A8BI(BK7EDMK(PD?&BI(7=A=?7:K(PD?ABI(BK7EDMK(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD?ABI(PD)AB
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?AA8M9J = 9B(@=A8M9?B8E9(?9@(@8AB78CDB8E96((
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 $B=?: K89M(\&?@(BI;8:?\ll I1(BKEDMK(9EB(9=:=AA?78\ll I1(8A(VQV1(E9=(M7?@D?B=(A=J89?7(;=7(A=J=AB=71(89(BK=87(?7=?A(EF(7=A=?7:K(?9@(;DC\&:?B8E96((09@EG=@(:K?87A(J?I(:KEEA=(BE(B=?:K(E9(BK=(D9@=7M7?@D?B=(\ll L=&?A(G=&&(09@EG=@(:K?87A(?7=(?&AE(=9:ED7?M=@(BE(:E9@D:B(7=?@89M(M7ED;A(?BB=9@=@(BE(CI(M7?@D?B=(ABD@=9BA1(BE(SEG)ABD@=BE(SEG)ABD@=BE(SEG)ABD@=BBA1(BE(SEG)ABD@)ABD@=BBA1(BE(SEG)ABD@=BBA1(BE(SEG)ABD@=BBA1(BE(SEG)ABD@)ABD@=BBA1(BE(SEG)ABD@)ABD@=BBA1(BE(SEG)ABD@)ABD@=BBA1(BE(SEG)ABD@)ABD@)ABD@(BE(SEG)ABD@$

 $E::?A8E9? \not < D9@=7M7? @D?B=A(?9@(F?:D&I(F7EJ(*\%-(?A(G=\not <?A(G))))))) \\ = (-1)^{1/2} ($

?B(?<<=L=<A(EF(BK=(:D778:D-DJ 1(F7EJ (89B7E@D:BE7I(:ED7A=A(BE(M7?@D?B=(A=J 89?7A1(@=;=9@89M(E9(BK=87(7=A=?7:K(89B=7=ABA(?9@(BK=87(=R;=7B8A=(?9@(BK=(9==@A(EF(BK=('=;?7BJ=9B6(+K=(9E7J?4?9@(=R;=:B=@(B=?:K89M(4E?@(8A(W0W1(BGE(:ED7A=A(;=7(A=J=AB=71(?B(?<=L=4A1(?M?891(@=;=9@89M(E9(BK=87(=R;=7B8A=1(ABD@=9B(7=PD87=J=9BA(?B(D9@=7M7?@D?B=(?9@(M7?@D?B=(<=L=4A6(

B=?: K89MQJ =9BE789MQ@87=: B89M1(Vae(A=7L8: =>(WT(+=9D7=(B7?: H(?9@(B=9D7=@(F?: D&I > \ae(7=A=?7: Kd(\ae(B=?: K89Md(Wae(A=7L8: =6(+K=A=(F: =7: =9B?M=A(J?I(EFB=9(F-D: BD?B=(@=; =9@89M(E9(7=A=?7: K(; 7EU=: BA1(F: =6) = 8) = 8) = 9BA1(J=9BE789M(=B: 61(?9@(=RB=9A8L=(A=7L8: =6) = 1) = 9BA6(+K=(; =7: =9B?M=A1(BK=7=FE7=1(?7=(?; ; 7ER8J?B=1(9EB(@=B=7J89?B=6(

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=L=9(?B(B&J=A(J=JC=7AK8; (89(BK=(OR=:DB8L=(OED9: &<EF(
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-98L=7A&BI(ND@8:8?</3=?789M(OEJJ8BB==1(-98L=7A&BI(B?AH(
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J=JC=7AK8; (E9(?@L&AE7I(CE?7@Ad(FE7(=R?J;<=>(O=9B=7(
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7=<?B&L=(BE(BK=(B&J=QGE7H(BK=A=(:EJJ8BJ=9BA(@=J?9@6(+K&A(&K)(BK=()==?7BJ=9B(OK?87(G&BK(BK=()=?96())=9BI(J=JC=7(?9@(F89?</a>);;7EL?</a>
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X6 + E; (B8=7); 7=AA=A1(GK8=(EFB=9)7?9H=@(CI)
  A: =: 8? \& h?B8E91(9E7J)? \ll I(?7=(8@=9B8F8=@(?A(BK=(JEAB(
  : EJ : = B8B8L = (?9@(J EAB(A = \leftarrow : B8L = 6))) RFE7@(-(27 = AA1))
  0?J C78@M=1(\#EDB<=@M=1(.EB7=('?J=1(5)+1(4?<=1(
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  BKDA(7=F \le B89M(BK=(:78B=78?(FE7(B=9D7=(?9@(
  ; 7EJ EB8E96(+K=(9E7J)?4=R; =: B?B8E9(FE7(09@EG=@(
  OK?87A(8A(FE7(\))^(?7B8: <=A(; =7(I = ?71(89B = 79?B8E9? <
  ?9@(9?B8E9?4; 7=A=9B?B8E9A1(?(CEEH(=L=7I(\))^(
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  OK?87bA(?; E89BJ = 9B(J?I(C=(B=7J89?B=@6(+K8A(
  AKED@(C=(=L8@=9B(BK7EDMK(&99D?4&:B8L8BI)))
  \#=; E7BA(?9@(: K?87(=L?\triangleleftD?B8E9A6(+K=(7E\leftarrow(EF(BK=(
  7=A=?7: K(FE7(CEBK(7=MD<?7(?9@(=9@EG=@(F?: D&I(
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  ?9@(=9@EG=@(F?: D&I6(((
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