

J h> RRk ,h`B;QMqK2i`v U9 @y @y0Vfk3fR3

* i HQ; .2b+`BThEQM;B;QMqK2i`B+ 7mM+iBQMb M/ i?2B` TTHB+ i
;` T?b- B/2MiBiB2b- i`B;QMqK2i`B+ 2[m iBQMb- p2+iQ`b- M/ +QKTH
* Qm`b2 P#D2+iBi2b,QKTH2iBM; i?Bb +Qm`b2- bim/2Mib rBHH #2 #H
RXb2 `B;?i i`B M;H2b iQ }M/ 2t +i p Hm2b Q7 bT2+B H M;H2bX
kX` T? M/ BMi2`T`2i T2`BQ/B+ 7mM+iBQMbX
jXaQH p2 i`B;QMqK2i`B+ M/ Bmp2`b2 i`B;QMqK2i`B+ 2[m iBQMbX
9XKTHQv i`B;QMqK2i`B+ B/2MiBiB2b r?2M M22/2/X
8Xb2 i?2 H rb Q7 aBM2b M/ *QbBM2b iQ b2i mT M/ bQH p2 TTHB2/
eXb2 p2+iQ` QT2` iBQMb iQ bQH p2 T`Q#H2KbX
dXQKKmMB+ i2 K i?2K iB+ H B/2 b mbBM; +Q`2+i M/ TT`QT`B i2

G2 `MBM; Pmi+QK2b M/ S2`7Q`K M+2 *`Bi2`B

RXBM/ M;H2b- `+@H2M;i?- `2 Q7 b2+iQ` Q7 +B`+H2 BM #Qi? /
*Q`2 *`Bi2`B ,
U V` r M M;H2 BM bi M/ `/ TQbBiBQM X
U#.2i2`KBM2 `272`2M+2 M;H2X
U+.2i2`KBM2 +Qi2`KBM H M;H2 Q7 ;Bp2M M;H2X
U/6BM/ i?2 `+@H2M;i?- ;Bp2M i?2` /Bmb M/ M M;H2X
U26BM/ i?2 M;mH ` M/ HBM2 ` p2HQ+Biv ;Bp2M bm{+B2Mi BM7Q
U7*QM p2`i #2ir22M ` /B Mb M/ /2;`22bX
//BiBQM H *`Bi2`B ,
U 6BM/ i?2 `2 Q7 b2+iQ` Q7 +B`+H2X

kX2}M2 i?2 bBt i`B;QMqK2i`B+ 7mM+iBQM M/ mb2 i?2K iQ bQH p2 T
*Q`2 *`Bi2`B ,

U V2}M2 i?2 bBt i`B;QMqK2i`B+ 7mM+iBQMb BM i2`Kb Q7 `B;?i i
U#.2Bp2M TQBMiQM i?2 i2`KBM H bB/2 Q7 M M;H2- +QKTmi2 i?2
U+.2Bp2M [m /` Mi M/ i?2 p Hm2 Q7 i`B;QMqK2i`B+ 7mM+iBQM
U/4i i2 UrBi?Qmi + H+mH iQ`V i?2 p Hm2b Q7 i?2 bBt i`B;QMqK
r?B+? ? p2 `272`2M+2 M;H2 i? iBb bT2+B H M;H2X
U2I62 + H+mH iQ` iQ TT`QtBK i2 i`B;QMqK2i`B+ p Hm2b Q7 `

jXaQH p2 TTHB2/ T`Q#H2Kb BmpQH pBM; `B;?i i`B M;H2bX

*Q`2 *`Bi2`B ,

U QHp2 `B;?i`B M;H2X

U#QHp2 TTHB2/`B;?i`B M;H2 T`Q#H2KbX

9X` T? i`B;QMqK2i`B+ 7mM+iBQMbX

*Q`2 *`Bi2`B ,

U Bp2M / i?2 KTHBim/2 T2`BQ/ M/ T? b2 b?B7i;Bp2M M 2[m iBQ

U#Bp2M M 2[m iBQM Q7 bBM2- +QbBM2- Q` i M;2Mi- /` r ;` T?
M/ i?2 tBb TT`QT`B i2HvX

U+:Bp2M i?2 ;` T? Q7 bBM2 Q` +QbBM2 +m`p2 /2i2`KBM2 M 2[m
//BiBQM H *`Bi2`B ,

U VBp2M M 2[m iBQM Q7 b2+ Mi- +Qb2+ Mi- Q` +Qi M;2Mi- /` r
i?2 ;` T? M/ i?2 tBb TT`QT`B i2HvX

8Xb2 # bB+ B/2MiBiB2b iQ p2`B7v //BiBQM H B/2MiBiB2bX

*Q`2 *`Bi2`B ,

U Vb2 i?2 ? H7@ M;H2 M/ /Qm#H2 @ M;H2 B/2MiBiB2b 7Q` bBM2
iBiB2bX

U#V2KQ`Bx2 i?2 7mM/ K2Mi H 2B;?i B/2MiBiB2bX

U+Vb2 i?2 bmK M/ /Bz2`2M+2 7Q`KmH b 7Q` bBM2 M/ +QbBM2 iQ
}M/ 2t +i p Hm2b Q7 i`B;QMqK2i`B+ 7mM+iBQMbX

U/Vb2 i?2 `2/m+iBQM sin(7Q`+b cos(x) = sqrt(a^2+b^2) sin(x+alpha) iQ p2`B7v Qi?2`
B/2MiBiB2b M/ +QK#BM2 r p27Q`KbX

U2aVim/2Mib rBHH /2KQMbi` i2 i?2 T`QQ7 Q7 i`B;QMqK2i`B+ B/2
HQ;B+ H K MM2`- rBi? i?2 TT`QT`B i2 7Q`K i UóH27i@`B;?iQ

eXQHp2 i`B;QMqK2i`B+ 2[m iBQMbX

*Q`2 *`Bi2`B ,

U Bp2M / i?2 2t +i p Hm2b Q7 2tT`2bbBQM b sin^-1(x) - cos^-1(x) b-2 MB;QMqK
tan^-1(x) V 7mM+iBQMbX

U#M2 i?2 ` M;2 Q7 Bp2`b2 i`B; 7mM+iBQM b TT`QT`B i2HviQ }M/
7mM+iBQM X

U+6BM/ i?2 bQHmiBQM b iQ i`B;QMqK2i`B+ 2[m iBQM QM T`2b+

U/Vb2 M B/2MiBiv iQ bQHp2 M i`B;QMqK2i`B+ 2[m iBQM X

dXb2 i?2 Q7 H r Q7 bBM2b- H r Q7 +QbBM2b- M/ p2+iQ`b iQ bQHp2

*Q`2 *`Bi2`B ,

U QHp2 i`B M;H2b rBi? i?2 H r Q7 bBM2b M/ i?2 H r Q7 +QbBM2

U#QHp2 TTHB2/ T`Q#H2Kb rBi? i`B M;H2b mbBM; i?2 H r Q7 bBM
HH i?`22 + b2bX

U+*QK#BM2 p2+iQ`b ;2QK2i`B+ HHv M/ H;2#` B+ HHvX
U/∇QMp2`i p2+iQ`b 7`QK + `i2bB M iQ i`B;QMqK2i`B+ 7Q`KX
U2āQHp2 TTHB2/ T`Q#H2Kb mbBM; p2+iQ`bX

//BiBQM H *`Bi2`B ,

U Vb2 i?2 /Qi T`Q/m+i M/ T`QD2+iBQMb iQ bQHp2 TTHB2/ T`Q#H

3X*QKTmi2 rBi? +QKTH2t MmK#2`bX

*Q`2 *`Bi2`B ,

U ∇QMp2`i +QKTH2t MmK#2`b 7`QK + `i2bB M iQ TQH `X

U#S2`7Q`K +QKTH2t `Bi?K2iB+ BM i?2`2+i M;mH ` M/ TQH `7Q

U+6/BM/`QQib M/ TQr2`b mbBM; .2 JQBp`2öb h?2Q`2KX