EXPLICIT FORMS OF INEQUALITIES USED IN THE PAPER A SHORT SOLUTION OF THE KISSING NUMBER PROBLEM IN DIMENSION THREE

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(1) $f(t) < 0$ for $t \in [-1/\sqrt{2}, 1/2]$:

$$6335495173841147385 5t^9/18446744073709551616 - 33540856802688427335t^7/4611686018427387904 + 7374998397970057 05t^5/144115188075855872 + 238400906961340515t^4/288230376151711744 - 2081669528318691135t^3/2305843009213693952 - 30557151173705979t^2/144115188075855872 + 163841663490464037t/18446744073709551616 - 25237451735841/288230376151711744 < 0$$

for $t \in [-1/\sqrt{2}, 1/2]$.

(2) $f(t) + f(1) \le 1.23$ for $t \in [-1, -1/\sqrt{2}]$:

$$63354951738411473855t^9/18446744073709551616 - 33540856802688427335t^7/4611686018427387904 + 737499839797005705t^5/144115188075855872 + 238400906961340515t^4/288230376151711744 - 2081669528318691135t^3/2305843009213693952 - 30557151173705979t^2/144115188075855872 + 163841663490464037t/18446744073709551616 - 6631864766528248087/28823037615171174400 \le 0$$

for $t \in [-1, -1/\sqrt{2}]$.

(3) $f'(t) \le 0$ for $t \in [-\cos(\pi/12), -1/\sqrt{2}]$:

$$57019456564570326469 5t^8/18446744073709551616 - 234785997618818991345t^6/4611686018427387904 + 4368749919898502852 5t^4/144115188075855872 + 238400906961340515t^3/72057594037927936 - 6245008584956073405t^2/2305843009213693952 - 30557151173705979t/72057594037927936 + 163841663490464037/18446744073709551616 \le 0$$

for $t \in [-\cos(\pi/12), -1/\sqrt{2}]$.

(4) $f(1) + f(t) + f(\alpha(t)) \le 1.23$ for $\alpha(t) = t/2 - \sqrt{3-3t^2}/2$ and $t \in [-\cos(\pi/12), -1/\sqrt{2}]$:

$$3259691292732353582391t/9444732965739290427392 -$$
$$1080197069544387138207\sqrt{3-3t^2}/9444732965739290427392 -$$
$$30557151173705979t^2/288230376151711744 +$$
$$4448431984616303657 85t^3/1180591620717411303424 +$$
$$238400906961340515t^4/576460752303423488 -$$
$$6005520750985263307 35t^5/590295810358705651712 +$$
$$1006225704080652820 05t^7/147573952589676412928 -$$
$$592974116189197629t\sqrt{3-3t^2}/1152921504606846976 -$$
$$1525255292870306036 55t^2\sqrt{3-3t^2}/1180591620717411303424 +$$
$$238400906961340515t^3\sqrt{3-3t^2}/576460752303423488 +$$
$$2023062565994190177 75t^4\sqrt{3-3t^2}/590295810358705651712 -$$
$$33540856802688427335t^6\sqrt{3-3t^2}/147573952589676412928 +$$

$$8768359315270699727/115292150460684697600 \leq 0$$

for $t \in [-\cos(\pi/12), -1/\sqrt{2}]$.

(5) $f''(t) \geq 0$ for $t \in [-\sqrt{2}/4 - 1/2, -1/\sqrt{2}]$:

$$570194565645703264695t^7/2305843009213693952 - 704357992856456974035t^5/2305843009213693952 + 3687499198985028525t^3/36028797018963968 + 715202720884021545t^2/72057594037927936 - 6245008584956073405t/1152921504606846976 - 30557151173705979/72057594037927936 \geq 0$$

for $t \in [-\sqrt{2}/4 - 1/2, -1/\sqrt{2}]$

(6) $f(1) + 2f(t) + f(\beta(t)) \leq 1.23$ for $\beta(t) = 2t/3 - \sqrt{6 - 8t^2}/3$ and $t \in [-\sqrt{2}/4 - 1/2, -\sqrt{2/3}]$:

$$25858182725486865173t/62257761248769736704 - 306146175050149862837\sqrt{6 - 8t^2}/4482558809911421042688 + 103967817732512167t^2/648518346341351424 - 71177356339443936265t^3/280159925619463815168 + 1986674224677837625t^4/3891110078048108544 + 4042629631028732825t^5/5836665117072162816 + 1546606174790633038225t^7/1680959553716782891008 - 293776911211014004265635t^9/181543631801412552228864 - 128376786800521031t\sqrt{6 - 8t^2}/324259173170675712 + 26543817661815994615t^2\sqrt{6 - 8t^2}/420239888429195722752 + 79466968987113505t^3\sqrt{6 - 8t^2}/243194379878006784 - 77353658582063293375t^4\sqrt{6 - 8t^2}/52529986053649465344 + 1941642932688963404615t^6\sqrt{6 - 8t^2}/472769874482845188096 - 4624911476904037591415t^8\sqrt{6 - 8t^2}/1418309623448535564288 - 346809645263238461/86469112845513523200 \leq 0$$

for $t \in [-\sqrt{2}/4 - 1/2, -\sqrt{2/3}]$.