ARI axioms
ARI problems

ARI001=1.p Integer: 2 less than 3
$\$less(2,3)$ tff(prove_2_less$_3$, conjecture)

ARI002=1.p Integer: 3 not less than 2
$\neg \$less(3,2)$ tff(prove_3_not_less$_2$, conjecture)

ARI003=1.p Integer: 2 less than 13
$\$less(2,13)$ tff(prove_2_less$_{13}$, conjecture)

ARI004=1.p Integer: Something less than 13
$\exists x$: \$int: $\$less(x,13)$ tff(something_less$_{13}$, conjecture)

ARI005=1.p Integer: 12 less than something
$\exists x$: \$int: $\$less(12,x)$ tff(prove_12_less_something, conjecture)

ARI006=1.p Integer: Something less than something
$\exists x$: \$int, y: \$int: $\$less(x,y)$ tff(something_less_something, conjecture)

ARI007=1.p Integer: -2 less than 2
$\$less(-2,2)$ tff(n2_less$_2$, conjecture)

ARI008=1.p Integer: -4 less than -2
$\$less(-4,-2)$ tff(n4_less_n$_2$, conjecture)

ARI009=1.p Integer: 2 not less than -2
$\neg \$less(2,-2)$ tff(prove_2_not_less_n$_2$, conjecture)

ARI010=1.p Integer: -2 not less than -4
$\neg \$less(-2,-4)$ tff(n2_not_less_n$_4$, conjecture)

ARI011=1.p Integer: Something less than 0
$\exists x$: \$int: $\$less(x,0)$ tff(something_less$_0$, conjecture)

ARI012=1.p Integer: Something less than -2
$\exists x$: \$int: $\$less(x,-2)$ tff(something_less_n$_2$, conjecture)

ARI013=1.p Integer: -2 less than something
$\exists x$: \$int: $\$less(-2,x)$ tff(n2_less_something, conjecture)

ARI014=1.p Integer: 2 lesseq to 2
$\$lesseq(2,2)$ tff(prove_2_lesseq$_2$, conjecture)

ARI015=1.p Integer: 2 lesseq to 3
$\$lesseq(2,3)$ tff(prove_2_lesseq$_3$, conjecture)

ARI016=1.p Integer: 3 not lesseq to 2
$\neg \$lesseq(3,2)$ tff(prove_3_not_lesseq$_2$, conjecture)

ARI017=1.p Integer: Something lesseq to 13
$\exists x$: \$int: $\$lesseq(x,13)$ tff(something_lesseq$_{13}$, conjecture)

ARI018=1.p Integer: 12 lesseq to something
$\exists x$: \$int: $\$lesseq(12,x)$ tff(prove_12_lesseq_something, conjecture)

ARI019=1.p Integer: Something lesseq to something
$\exists x$: \$int, y: \$int: $\$lesseq(x,y)$ tff(something_lesseq_something, conjecture)

ARI020=1.p Integer: -2 lesseq to -2
$\$lesseq(-2,-2)$ tff(n2_lesseq_n$_2$, conjecture)

ARI021=1.p Integer: -2 lesseq to 2
$\$lesseq(-2,2)$ tff(n2_lesseq$_2$, conjecture)

ARI022=1.p Integer: -4 lesseq to -2
$\$lesseq(-4,-2)$ tff(n4_lesseq_n$_2$, conjecture)

ARI023=1.p Integer: 2 not lesseq to -2
$\neg \$lesseq(2,-2)$ tff(prove_2_not_lesseq_n$_2$, conjecture)

ARI024=1.p Integer: -2 not lesseq to -4
$\neg\,\$\text{lesseq}(-2,-4) \qquad \text{tff}(\text{n2\_not\_lesseq\_n}_4, \text{conjecture})$

ARI025=1.p Integer: Something lesseq to 0
$\exists x\text{: \$int: }\$\text{lesseq}(x,0) \qquad \text{tff}(\text{something\_lesseq}_0, \text{conjecture})$

ARI026=1.p Integer: Something lesseq to -2
$\exists x\text{: \$int: }\$\text{lesseq}(x,-2) \qquad \text{tff}(\text{something\_lesseq\_n}_2, \text{conjecture})$

ARI027=1.p Integer: -2 lesseq to something
$\exists x\text{: \$int: }\$\text{lesseq}(-2,x) \qquad \text{tff}(\text{n2\_lesseq\_something}, \text{conjecture})$

ARI028=1.p Integer: 4 greater than 3
$\$\text{greater}(4,3) \qquad \text{tff}(\text{prove\_4\_greater}_3, \text{conjecture})$

ARI029=1.p Integer: 3 not greater than 4
$\neg\,\$\text{greater}(3,4) \qquad \text{tff}(\text{prove\_3\_not\_greater}_4, \text{conjecture})$

ARI030=1.p Integer: 17 greater than 8
$\$\text{greater}(17,8) \qquad \text{tff}(\text{prove\_17\_greater}_8, \text{conjecture})$

ARI031=1.p Integer: Something greater than 15
$\exists x\text{: \$int: }\$\text{greater}(x,15) \qquad \text{tff}(\text{something\_greater}_{15}, \text{conjecture})$

ARI032=1.p Integer: 15 greater than something
$\exists x\text{: \$int: }\$\text{greater}(15,x) \qquad \text{tff}(\text{prove\_15\_greater\_something}, \text{conjecture})$

ARI033=1.p Integer: Something greater than something
$\exists x\text{: \$int}, y\text{: \$int: }\$\text{greater}(x,y) \qquad \text{tff}(\text{something\_greater\_something}, \text{conjecture})$

ARI034=1.p Integer: 4 greater than -4
$\$\text{greater}(4,-4) \qquad \text{tff}(\text{prove\_4\_greater\_n}_4, \text{conjecture})$

ARI035=1.p Integer: -4 greater than -6
$\$\text{greater}(-4,-6) \qquad \text{tff}(\text{n4\_greater\_n}_6, \text{conjecture})$

ARI036=1.p Integer: -3 not greater than 3
$\neg\,\$\text{greater}(-3,3) \qquad \text{tff}(\text{prove\_n3\_not\_greater}_3, \text{conjecture})$

ARI037=1.p Integer: -5 not greater than -3
$\neg\,\$\text{greater}(-5,-3) \qquad \text{tff}(\text{n5\_not\_greater\_n}_3, \text{conjecture})$

ARI038=1.p Integer: Something greater than 0
$\exists x\text{: \$int: }\$\text{greater}(x,0) \qquad \text{tff}(\text{something\_greater}_0, \text{conjecture})$

ARI039=1.p Integer: Something greater than -5
$\exists x\text{: \$int: }\$\text{greater}(x,-5) \qquad \text{tff}(\text{something\_greater\_n}_5, \text{conjecture})$

ARI040=1.p Integer: -5 greater than something
$\exists x\text{: \$int: }\$\text{greater}(-5,x) \qquad \text{tff}(\text{n5\_greater\_something}, \text{conjecture})$

ARI041=1.p Integer: 2 greatereq to 2
$\$\text{greatereq}(2,2) \qquad \text{tff}(\text{prove\_2\_greatereq}_2, \text{conjecture})$

ARI042=1.p Integer: 4 greatereq to 3
$\$\text{greatereq}(4,3) \qquad \text{tff}(\text{prove\_4\_greatereq}_3, \text{conjecture})$

ARI043=1.p Integer: 6 not greatereq to 7
$\neg\,\$\text{greatereq}(6,7) \qquad \text{tff}(\text{prove\_6\_not\_greatereq}_7, \text{conjecture})$

ARI044=1.p Integer: Something greatereq to 15
$\exists x\text{: \$int: }\$\text{greatereq}(x,15) \qquad \text{tff}(\text{something\_greatereq}_{15}, \text{conjecture})$

ARI045=1.p Integer: 15 greatereq to something
$\exists x\text{: \$int: }\$\text{greatereq}(15,x) \qquad \text{tff}(\text{prove\_15\_greatereq\_something}, \text{conjecture})$

ARI046=1.p Integer: Something greatereq to something
$\exists x\text{: \$int}, y\text{: \$int: }\$\text{greatereq}(x,y) \qquad \text{tff}(\text{something\_greatereq\_something}, \text{conjecture})$

ARI047=1.p Integer: -4 greatereq to -4
$\$\text{greatereq}(-4,-4) \qquad \text{tff}(\text{n4\_greatereq\_n}_4, \text{conjecture})$

ARI048=1.p Integer: 4 greatereq to -6
$\$\text{greatereq}(4,-6) \qquad \text{tff}(\text{prove\_4\_greatereq\_n}_6, \text{conjecture})$

ARI049=1.p Integer: -3 greatereq to -6
$\$greatereq(-3, -6)$ $\quad$ $tff(n3\_greatereq\_n_6, conjecture)$

ARI050=1.p Integer: -3 not greatereq to 3
$\neg \$greatereq(-3, 3)$ $\quad$ $tff(prove\_n3\_not\_greatereq_3, conjecture)$

ARI051=1.p Integer: -5 not greatereq to -3
$\neg \$greatereq(-5, -3)$ $\quad$ $tff(n5\_not\_greatereq\_n_3, conjecture)$

ARI052=1.p Integer: Something greatereq to 0
$\exists x$: \$int: $\$greatereq(x, 0)$ $\quad$ $tff(something\_greatereq_0, conjecture)$

ARI053=1.p Integer: Something greatereq to -5
$\exists x$: \$int: $\$greatereq(x, -5)$ $\quad$ $tff(something\_greatereq\_n_5, conjecture)$

ARI054=1.p Integer: -5 greatereq to something
$\exists x$: \$int: $\$greatereq(-5, x)$ $\quad$ $tff(n5\_greatereq\_something, conjecture)$

ARI055=1.p Integer: 31 not 12
$31 \neq 12$ $\quad$ $tff(prove\_31\_not_{12}, conjecture)$

ARI056=1.p Integer: Something not 12
$\exists x$: \$int: $x \neq 12$ $\quad$ $tff(something\_not_{12}, conjecture)$

ARI057=1.p Integer: Sum 2 and 3 is 5
$\$sum(2, 3) = 5$ $\quad$ $tff(sum\_2\_3_5, conjecture)$

ARI058=1.p Integer: Sum 23 and 34 is 57
$\$sum(23, 34) = 57$ $\quad$ $tff(sum\_23\_34_{57}, conjecture)$

ARI059=1.p Integer: Sum 23 and 34 is something
$\exists x$: \$int: $\$sum(23, 34) = x$ $\quad$ $tff(sum\_23\_34\_something, conjecture)$

ARI060=1.p Integer: Sum something and 23 is 34
$\exists x$: \$int: $\$sum(x, 23) = 34$ $\quad$ $tff(sum\_something\_23_{34}, conjecture)$

ARI061=1.p Integer: Sum 23 and something is 34
$\exists x$: \$int: $\$sum(23, x) = 34$ $\quad$ $tff(sum\_23\_something_{34}, conjecture)$

ARI062=1.p Integer: Sum 2 and 3 is not 6
$\$sum(2, 3) \neq 6$ $\quad$ $tff(sum\_2\_3\_not_6, conjecture)$

ARI063=1.p Integer: Sum 2 and 3 is only 5
$\forall x$: \$int: $(\$sum(2, 3) = x \ \Rightarrow\ x = 5)$ $\quad$ $tff(sum\_2\_3\_only_5, conjecture)$

ARI064=1.p Integer: Sum only 2 and 3 is 5
$\forall x$: \$int: $(\$sum(x, 3) = 5 \ \Rightarrow\ x = 2)$ $\quad$ $tff(sum\_only\_2\_3_5, conjecture)$

ARI065=1.p Integer: Sum 2 and only 3 is 5
$\forall x$: \$int: $(\$sum(2, x) = 5 \ \Rightarrow\ x = 3)$ $\quad$ $tff(sum2\_only\_3_5, conjecture)$

ARI066=1.p Integer: Sum -2 and -5 is -7
$\$sum(-2, -5) = -7$ $\quad$ $tff(sum\_n2\_n5\_n_7, conjecture)$

ARI067=1.p Integer: Sum 2 and -5 is -3
$\$sum(2, -5) = -3$ $\quad$ $tff(sum\_2\_n5\_n_3, conjecture)$

ARI068=1.p Integer: Sum 5 and -2 is 3
$\$sum(5, -2) = 3$ $\quad$ $tff(sum\_5\_n2_3, conjecture)$

ARI069=1.p Integer: Sum 5 and -5 is 0
$\$sum(5, -5) = 0$ $\quad$ $tff(sum\_5\_n5_0, conjecture)$

ARI070=1.p Integer: Sum -2 and -5 is something
$\exists x$: \$int: $\$sum(-2, -5) = x$ $\quad$ $tff(sum\_n2\_n5\_what, conjecture)$

ARI071=1.p Integer: Sum 2 and -5 is something
$\exists y$: \$int: $\$sum(2, -5) = y$ $\quad$ $tff(sum\_2\_n5\_what, conjecture)$

ARI072=1.p Integer: Sum 5 and -2 is something
$\exists x$: \$int: $\$sum(5, -2) = x$ $\quad$ $tff(sum\_5\_n2\_what, conjecture)$

ARI073=1.p Integer: Sum 5 and -5 is something
$\exists x$: \$int: $\$sum(5, -5) = x$ $\quad$ $tff(sum\_5\_n5\_what, conjecture)$

ARI074=1.p Integer: Sum something and -5 is -7
$\exists x$: \$int: \$sum$(x, -5) = -7$ tff(sum_what_n5_n$_7$, conjecture)

ARI075=1.p Integer: Sum something and -5 is -3
$\exists x$: \$int: \$sum$(x, -5) = -3$ tff(sum_what_n5_n$_3$, conjecture)

ARI076=1.p Integer: Sum something and -2 is 3
$\exists x$: \$int: \$sum$(x, -2) = 3$ tff(sum_what_n2$_3$, conjecture)

ARI077=1.p Integer: Sum something and -5 is 0
$\exists x$: \$int: \$sum$(x, -5) = 0$ tff(sum_what_n5$_0$, conjecture)

ARI078=1.p Integer: Sum with zero is the identity
$\exists x$: \$int: \$sum$(x, 0) = x$ tff(sum_zero_identity, conjecture)

ARI079=1.p Integer: Sum something and another thing is the first thing
$\exists x$: \$int, y: \$int: \$sum$(x, y) = x$ tff(sum_something_anotherthing_firstthing, conjecture)

ARI080=1.p Integer: Sum 4 and 4 is 8
$\exists x$: \$int, y: \$int: (\$sum$(x, y) = 8$ and $x = 4$ and $y = 4$) tff(sum_4_4$_8$, conjecture)

ARI081=1.p Integer: Communative sum of 6 and 7
$\forall z_1$: \$int, z_2: \$int: ((\$sum$(6, 7) = z_1$ and \$sum$(7, 6) = z_2$) $\Rightarrow$ $z_1 = z_2$) tff(communative_sum_6$_7$, conjecture)

ARI082=1.p Integer: Associative sum
$\forall z_1$: \$int, z_2: \$int, z_3: \$int, z_4: \$int: ((\$sum$(2, 3) = z_1$ and \$sum$(z_1, 6) = z_2$ and \$sum$(3, 6) = z_3$ and \$sum$(2, z_3) = z_4$) $\Rightarrow$ $z_2 = z_4$) tff(associative_sum, conjecture)

ARI083=1.p Integer: Associative sum exists
$\exists x$: \$int, y: \$int, z: \$int, z_1: \$int, z_2: \$int, z_3: \$int, z_4: \$int: ((\$sum$(x, y) = z_1$ and \$sum$(z_1, z) = z_2$ and \$sum$(y, z) = z_3$ and \$sum$(x, z_3) = z_4$) $\Rightarrow$ $z_2 = z_4$) tff(associative_sum_exists, conjecture)

ARI084=1.p Integer: Sum 2 and 3 is 5 in a predicate
p: \$int $\rightarrow$ \$o tff(p_type, type)
p(\$sum$(2, 3)$) $\Rightarrow$ $p(5)$ tff(sum_2_3_5_predicate, conjecture)

ARI085=1.p Integer: Sum something and another thing is 7, in a predicate
p: (\$int $\times$ \$int) $\rightarrow$ \$o tff(p_type, type)
($p(3, 4)$ and $\neg\, p(1, 6)$) $\Rightarrow$ $\exists x$: \$int, y: \$int: ($p(x, y)$ and \$sum$(x, y) = 7$) tff(sum_X_Y_7_predicate, conjecture)

ARI086=1.p Integer: Sum 2 and 2 is 5
\$sum$(2, 2) = 5$ tff(anti_sum_2_2$_5$, conjecture)

ARI087=1.p Integer: Sum something and something is 0
$\exists x$: \$int: ($x \neq 0$ and \$sum$(x, x) = 0$) tff(anti_sum_what_what$_0$, conjecture)

ARI088=1.p Integer: Sum only 4 and only 4 is 8
$\forall x$: \$int, y: \$int: (\$sum$(x, y) = 8$ $\Rightarrow$ ($x = 4$ and $y = 4$)) tff(anti_sum_only_4_only_4$_8$, conjecture)

ARI089=1.p Integer: Difference 7 and 5 is 2
\$difference$(7, 5) = 2$ tff(diff_7_5$_2$, conjecture)

ARI090=1.p Integer: Difference 5 and 3 is only 2
$\forall x$: \$int: (\$difference$(5, 3) = x$ $\Rightarrow$ $x = 2$) tff(diff_5_3_only$_2$, conjecture)

ARI091=1.p Integer: Difference only 5 and 2 is 3
$\forall x$: \$int: (\$difference$(x, 2) = 3$ $\Rightarrow$ $x = 5$) tff(diff_only_5_2$_3$, conjecture)

ARI092=1.p Integer: Difference 5 and only 3 is 2
$\forall x$: \$int: (\$difference$(5, x) = 2$ $\Rightarrow$ $x = 3$) tff(diff_5_only_3$_2$, conjecture)

ARI093=1.p Integer: Difference with zero is identity
$\exists x$: \$int: \$difference$(x, 0) = x$ tff(diff_zero_identity, conjecture)

ARI094=1.p Integer: Difference 5 and 3 is 2 in a predicate
p: \$int $\rightarrow$ \$o tff(p_type, type)
p(\$difference$(5, 3)$) $\Rightarrow$ $p(2)$ tff(diff_5_3_2_predicate, conjecture)

ARI095=1.p Integer: Lower boundary for bytes
$\exists x$: \$int: \$difference$(-128, 1) = x$ tff(lower_boundary, conjecture)

ARI096=1.p Integer: Product of 2 and 3 is 6
\$product$(2, 3) = 6$ tff(product_2_3$_6$, conjecture)

ARI097=1.p Integer: Product of -2 and 3 is -6
\$product$(-2, 3) = -6$ tff(product_n2_3_n$_{6}$, conjecture)

ARI098=1.p Integer: Product of -2 and -3 is 6
\$product$(-2, -3) = 6$ tff(product_n2_n3$_{6}$, conjecture)

ARI099=1.p Integer: Product of 11 and 11 is 121
\$product$(11, 11) = 121$ tff(product_11_11$_{121}$, conjecture)

ARI100=1.p Integer: Product of 11 and 11 is something
$\exists x$: \$int: \$product$(11, 11) = x$ tff(product_11_11_something, conjecture)

ARI101=1.p Integer: Product of something and 11 is 121
$\exists x$: \$int: \$product$(x, 11) = 121$ tff(product_something_11$_{121}$, conjecture)

ARI102=1.p Integer: Product of 11 and something is 121
$\exists x$: \$int: \$product$(11, x) = 121$ tff(product_11_something$_{121}$, conjecture)

ARI103=1.p Integer: Product of 2 and 3 is not 5
\$product$(2, 3) \neq 5$ tff(product_2_3_not$_{5}$, conjecture)

ARI104=1.p Integer: Product of 2 and 3 is only 6
$\forall x$: \$int: (\$product$(2, 3) = x \Rightarrow x = 6$) tff(product_2_3_only$_{6}$, conjecture)

ARI105=1.p Integer: Product of only 2 and 3 is 6
$\forall x$: \$int: (\$product$(x, 3) = 6 \Rightarrow x = 2$) tff(product_only_2_3$_{6}$, conjecture)

ARI106=1.p Integer: Product of 2 and only 3 is 6
$\forall x$: \$int: (\$product$(2, x) = 6 \Rightarrow x = 3$) tff(product_2_only_3$_{6}$, conjecture)

ARI107=1.p Integer: Product of -2 and -5 is 10
\$product$(-2, -5) = 10$ tff(product_n2_n5$_{10}$, conjecture)

ARI108=1.p Integer: Product of 2 and -5 is -10
\$product$(2, -5) = -10$ tff(product_2_n5_n$_{10}$, conjecture)

ARI109=1.p Integer: Product of 5 and -2 is -10
\$product$(5, -2) = -10$ tff(product_5_n2_n$_{10}$, conjecture)

ARI110=1.p Integer: Product of 5 and 0 is 0
\$product$(5, 0) = 0$ tff(product_5_0$_{0}$, conjecture)

ARI111=1.p Integer: Product of -2 and -5 is something
$\exists x$: \$int: \$product$(-2, -5) = x$ tff(product_n2_n5_what, conjecture)

ARI112=1.p Integer: Product of 2 and -5 is something
$\exists y$: \$int: \$product$(2, -5) = y$ tff(product_2_n5_what, conjecture)

ARI113=1.p Integer: Product of 5 and -2 is something
$\exists x$: \$int: \$product$(5, -2) = x$ tff(product_5_n2_what, conjecture)

ARI114=1.p Integer: Product of something and -5 is -10
$\exists x$: \$int: \$product$(x, -5) = -10$ tff(product_what_n5_n$_{10}$, conjecture)

ARI115=1.p Integer: Product of something and -5 is 10
$\exists x$: \$int: \$product$(x, -5) = 10$ tff(product_what_n5$_{10}$, conjecture)

ARI116=1.p Integer: Product of zero and something is zero
$\exists x$: \$int: \$product$(x, 0) = 0$ tff(product_zero_identity, conjecture)

ARI117=1.p Integer: Product with 1 is the identity
$\exists x$: \$int: \$product$(x, 1) = x$ tff(product_1_identity, conjecture)

ARI118=1.p Integer: Product of something and another thing is the first thing
$\exists x$: \$int, y: \$int: \$product$(x, y) = x$ tff(product_something_anotherthing_firstthing, conjecture)

ARI119=1.p Integer: Product of 4 and 4 is 16
$\exists x$: \$int, y: \$int: (\$product$(x, y) = 16$ and $x = 4$ and $y = 4$) tff(product_4_4$_{16}$, conjecture)

ARI120=1.p Integer: Product of X and X is 4
p: \$int $\rightarrow$ \$o tff(p_type, type)
$p(2) \Rightarrow \exists x$: \$int, y: \$int: ($p(x)$ and $x \neq y$ and \$product$(y, y) = 4$) tff(product_X_X_4_predicate, conjecture)

ARI121=1.p Integer: Commutative product of 6 and 7

$\forall z_1$: \$int, z_2: \$int: ((\$product(6, 7) $= z_1$ and \$product(7, 6) $= z_2$) $\Rightarrow$ $z_1 = z_2$) tff(commutative_product_6_7, conjecture)

ARI122=1.p Integer: Associative product
$\forall z_1$: \$int, z_2: \$int, z_3: \$int, z_4: \$int: ((\$product(2, 3) $= z_1$ and \$product(z_1, 6) $= z_2$ and \$product(3, 6) $= z_3$ and \$product(2, z_3) $=$ z_4) $\Rightarrow$ $z_2 = z_4$) tff(associative_product, conjecture)

ARI123=1.p Integer: Associative product exists
$\exists x$: \$int, y: \$int, z: \$int, z_1: \$int, z_2: \$int, z_3: \$int, z_4: \$int: ((\$product(x, y) $= z_1$ and \$product(z_1, z) $= z_2$ and \$product(y, z) $=$ z_3 and \$product(x, z_3) $= z_4$) $\Rightarrow$ $z_2 = z_4$) tff(associative_product_exists, conjecture)

ARI124=1.p Integer: Product of 5 and 3 is 15 in a predicate
p: \$int $\rightarrow$ \$o tff(p_type, type)
p(\$product(5, 3)) $\Rightarrow$ $p(15)$ tff(product_5_3_15_predicate, conjecture)

ARI125=1.p Integer: Product of 2 and 2 is not 5
\$product(2, 2) $= 5$ tff(anti_product_2_2_5, conjecture)

ARI126=1.p Integer: Product of something and itself is not 0
$\exists x$: \$int: ($x \neq 0$ and \$product(x, x) $= 0$) tff(anti_product_what_what_0, conjecture)

ARI127=1.p Integer: Not product of only 2 and only 4 is 8
$\forall x$: \$int, y: \$int: (\$product(x, y) $= 8$ $\Rightarrow$ ($x = 2$ and $y = 4$)) tff(anti_product_only_2_only_4_8, conjecture)

ARI128=1.p Integer: -2 equal - 2
$-2 =$ \$uminus(2) tff(n2_equal_uminus_2, conjecture)

ARI129=1.p Integer: 2 equal - -2
$2 =$ \$uminus(-2) tff(n2_equal_uminus_n_2, conjecture)

ARI130=1.p Integer: Sum of 2 and - 2 is 0
\$sum(2, \$uminus(2)) $= 0$ tff(sum_2_uminus_to_0, conjecture)

ARI131=1.p Integer: Sum of -2 and - 2 is 0
\$sum(-2, \$uminus(-2)) $= 0$ tff(sum_n2_uminus_to_0, conjecture)

ARI132=1.p Integer: - - 2 is 2
\$uminus(\$uminus(2)) $= 2$ tff(uminus_uminus_2, conjecture)

ARI133=1.p Integer: - - -2 is -2
\$uminus(\$uminus(-2)) $= -2$ tff(uminus_uminus_n_2, conjecture)

ARI162=1.p Integer: Sum is 8 and difference is 0
$\exists x$: \$int, y: \$int: (\$sum(x, y) $= 8$ and \$difference(x, y) $= 0$) tff(sum_and_difference, conjecture)

ARI163=1.p Integer: Between -1 and 1 must be 0
$\forall x$: \$int: ((\$less($-1, x$) and \$less(x, 1)) $\Rightarrow$ \$sum(21, x) $= 21$) tff(sum_something_0_something, conjecture)

ARI164=1.p Integer: Something is less than sum of something and 1
$\exists x$: \$int, y: \$int: (\$sum(x, 1) $= y$ and \$less(x, y)) tff(exist_bigger_plus_one, conjecture)

ARI165=1.p Integer: Sum of 2 and 3 is less than 6
$\forall x$: \$int: (\$sum(2, 3) $= x$ $\Rightarrow$ \$less(x, 6)) tff(sum_2_3_less_6, conjecture)

ARI166=1.p Integer: 4 is less than the sum of 2 and 3
$\forall x$: \$int: (\$sum(2, 3) $= x$ $\Rightarrow$ \$less(4, x)) tff(sum_2_3_greater_4, conjecture)

ARI167=1.p Integer: -4 * (127 - 99) < (- 3) + 27
\$less(\$product(-4, \$difference(127, 99)), \$sum(\$uminus(3), 27)) tff(complex_2, conjecture)

ARI168=1.p Integer: Not sum is 8 and difference is 1
$\exists x$: \$int, y: \$int: (\$sum(x, y) $= 8$ and \$difference(x, y) $= 1$) tff(anti_exists_sum_consecutive_8, conjecture)

ARI169=1.p Integer: Not sum is 8 implies difference is 1
$\forall x$: \$int, y: \$int: (\$sum(x, y) $= 8$ $\Rightarrow$ \$difference(x, y) $= 1$) tff(anti_all_sum_consecutive_8, conjecture)

ARI170=1.p Integer: Not sum is 8 implies difference is 0
$\forall x$: \$int, y: \$int: (\$sum(x, y) $= 8$ $\Rightarrow$ \$difference(x, y) $= 0$) tff(anti_all_sum_same_8, conjecture)

ARI171=1.p Integer: Not 7 less than sum of 2 and 3
$\forall x$: \$int: (\$sum(2, 3) $= x$ $\Rightarrow$ \$less(7, x)) tff(anti_sum_2_3_greater_7, conjecture)

ARI172=1.p Integer: Sum of something and itself is less than -10
$\exists u$: \$int: \$less(\$sum(u, u), -10) tff(co_1, conjecture)

ARI173=1.p Integer: Formula less that -12
$\exists u$: \$int: \$less(\$sum(\$product(u, 3), −5), −12) tff(co$_1$, conjecture)

ARI174=1.p Integer: Formula equals 24
$\exists u$: \$int, v: \$int: \$sum(\$product(3, u), \$product(5, v)) = 24 tff(co$_1$, conjecture)

ARI175=1.p Integer: Formula equals 23
$\exists u$: \$int, v: \$int: \$sum(\$product(3, u), \$product(5, v)) = 23 tff(co$_1$, conjecture)

ARI176=1.p Integer: Formula equals 22
$\exists u$: \$int, v: \$int: \$sum(\$product(3, u), \$product(5, v)) = 22 tff(co$_1$, conjecture)

ARI177=1.p Integer: Formula equals 21
$\forall u$: \$int, v: \$int: \$sum(\$product(4, u), \$product(6, v)) $\neq$ 21 tff(co$_1$, conjecture)

ARI178=1.p Integer: It can't be 0
$\forall u$: \$int, v: \$int, w: \$int: ((\$sum(\$sum(\$product(2, u), v), w) = 10 and \$sum(\$sum(u, \$product(2, v)), w) = 10) $\Rightarrow$ $w \neq 0$) tff(co$_1$, conjecture)

ARI179=1.p Integer: It must be 2
$\forall u$: \$int, v: \$int, w: \$int: ((\$less(u, 5) and \$less(v, 3) and \$greater(\$sum(u, \$product(2, v)), 7)) $\Rightarrow$ $v = 2$) tff(co$_1$, conjectur

ARI180=1.p Integer: It must be the function of 0
f: \$int $\rightarrow$ \$int tff(f_type, type)
$\forall u$: \$int, v: \$int: ((\$sum(u, v) = $f(u)$ and \$difference(v, $f(u)$) = 0) $\Rightarrow$ $v = f(0)$) tff(co$_1$, conjecture)

ARI181=1.p Integer: Increasing function applied 3 times
f: \$int $\rightarrow$ \$int tff(f_type, type)
$\forall u$: \$int: \$greater($f(u)$, u) $\Rightarrow$ \$greatereq($f(f(f(6)))$, 9) tff(co$_1$, conjecture)

ARI182=1.p Integer: Increasing function in a formula
f: \$int $\rightarrow$ \$int tff(f_type, type)
$\forall u$: \$int: \$greater($f(u)$, u) $\Rightarrow$ $\forall v$: \$int, w: \$int: \$greatereq(f(\$sum($f(v)$, w)), \$sum(\$sum(v, w), 2)) tff(co$_1$, conjecture)

ARI183=1.p Integer: Monotonic function formula 1
f: \$int $\rightarrow$ \$int tff(f_type, type)
$\forall u$: \$int, v: \$int: (\$less(u, v) $\Rightarrow$ \$less($f(u)$, $f(v)$)) $\Rightarrow$ $\forall w$: \$int: \$greater(f(\$sum($f(w)$, 2)), $f(f(w))$) tff(co$_1$, conjecture)

ARI184=1.p Integer: Monotonic function formula 2
f: \$int $\rightarrow$ \$int tff(f_type, type)
$\forall u$: \$int, v: \$int: (\$less(u, v) $\Rightarrow$ \$less($f(u)$, $f(v)$)) $\Rightarrow$ $\forall w$: \$int: \$greater(f(\$sum($f(w)$, 2)), \$sum($f(f(w))$, 1)) tff(co$_1$, conj

ARI185=1.p Integer: Positive function formula
f: \$int $\rightarrow$ \$int tff(f_type, type)
$\forall u$: \$int: \$greater($f(u)$, 1) $\Rightarrow$ \$less(\$difference(7, \$product(2, $f(3)$)), 4) tff(co$_1$, conjecture)

ARI186=1.p Integer: Function of two arguments
g: (\$int $\times$ \$int) $\rightarrow$ \$int tff(g_type, type)
$\forall u$: \$int, v: \$int: $g(u, v)$ = g(u, \$sum(v, 2)) $\Rightarrow$ ($g(3, 3) = g(3, 4)$ $\Rightarrow$ $g(3, 2) = g(3, 5)$) tff(co$_1$, conjecture)

ARI187=1.p Integer: Sum of product of 14 and 3, and 8, is 50 in a predicate
p: \$int $\rightarrow$ \$o tff(p_type, type)
p(\$sum(\$product(14, 3), 8)) $\Rightarrow$ $p(50)$ tff(co$_1$, conjecture)

ARI188=1.p Integer: Sum of something and 3 is 5 in a predicate
p: \$int $\rightarrow$ \$o tff(p_type, type)
$\forall u$: \$int: p(\$sum(u, 3)) $\Rightarrow$ $p(5)$ tff(co$_1$, conjecture)

ARI189=1.p Integer: Product of 2 and something is 10 in a predicate
p: \$int $\rightarrow$ \$o tff(p_type, type)
$\forall u$: \$int: p(\$product(2, u)) $\Rightarrow$ $p(10)$ tff(co$_1$, conjecture)

ARI190=1.p Rational: 3/4 less than 7/8
\$less(3/4, 7/8) tff(rat_less_problem$_1$, conjecture)

ARI191=1.p Rational: 1/2 not less 1/21
$\neg$ \$less(1/2, 1/21) tff(rat_less_problem$_2$, conjecture)

ARI192=1.p Rational: 1/5 less than 4/15
\$less(1/5, 4/15) tff(rat_less_problem$_3$, conjecture)

ARI193=1.p Rational: Something less than 9/16

$\exists x$: \$rat: \$less$(x, 9/16)$ tff(rat_less_problem$_4$, conjecture)

ARI194=1.p Rational: 13/24 less than something
$\exists x$: \$rat: \$less$(13/24, x)$ tff(rat_less_problem$_5$, conjecture)

ARI195=1.p Rational: Something less than something else
$\exists x$: \$rat, y: \$rat: \$less(x, y) tff(rat_less_problem$_6$, conjecture)

ARI196=1.p Rational: -1/4 less than 1/4
\$less$(-1/4, 1/4)$ tff(rat_less_problem$_7$, conjecture)

ARI197=1.p Rational: -5/8 less than -3/8
\$less$(-5/8, -3/8)$ tff(rat_less_problem$_8$, conjecture)

ARI198=1.p Rational: 1/4 not less than -1/4
$\neg$ \$less$(1/4, -1/4)$ tff(rat_less_problem$_9$, conjecture)

ARI199=1.p Rational: -3/8 not less than -5/8
$\neg$ \$less$(-3/8, -5/8)$ tff(rat_less_problem$_{10}$, conjecture)

ARI200=1.p Rational: Something less than 0/1
$\exists x$: \$rat: \$less$(x, 0/1)$ tff(rat_less_problem$_{11}$, conjecture)

ARI201=1.p Rational: Something less than -13/4
$\exists x$: \$rat: \$less$(x, -13/4)$ tff(rat_less_problem$_{12}$, conjecture)

ARI202=1.p Rational: -13/4 less than something
$\exists x$: \$rat: \$less$(-13/4, x)$ tff(rat_less_problem$_{13}$, conjecture)

ARI203=1.p Rational: 5/12 lesseq to 5/12
\$lesseq$(5/12, 5/12)$ tff(rat_lesseq_problem$_1$, conjecture)

ARI204=1.p Rational: 1/4 lesseq to 5/12
\$lesseq$(1/4, 5/12)$ tff(rat_lesseq_problem$_2$, conjecture)

ARI205=1.p Rational: 5/12 not lesseq to 1/4
$\neg$ \$lesseq$(5/12, 1/4)$ tff(rat_lesseq_problem$_3$, conjecture)

ARI206=1.p Rational: Something lesseq to 19/25
$\exists x$: \$rat: \$lesseq$(x, 19/25)$ tff(rat_lesseq_problem$_4$, conjecture)

ARI207=1.p Rational: 3/16 lesseq to something
$\exists x$: \$rat: \$lesseq$(3/16, x)$ tff(rat_lesseq_problem$_5$, conjecture)

ARI208=1.p Rational: Something lesseq to something else
$\exists x$: \$rat, y: \$rat: \$lesseq(x, y) tff(rat_lesseq_problem$_6$, conjecture)

ARI209=1.p Rational: -3/4 lesseq to -3/4
\$lesseq$(-3/4, -3/4)$ tff(rat_lesseq_problem$_7$, conjecture)

ARI210=1.p Rational: -3/4 lesseq to 3/4
\$lesseq$(-3/4, 3/4)$ tff(rat_lesseq_problem$_8$, conjecture)

ARI211=1.p Rational: -5/8 lesseq to -1/4
\$lesseq$(-5/8, -1/4)$ tff(rat_lesseq_problem$_9$, conjecture)

ARI212=1.p Rational: 3/4 not lesseq to -3/4
$\neg$ \$lesseq$(3/4, -3/4)$ tff(rat_lesseq_problem$_{10}$, conjecture)

ARI213=1.p Rational: -1/4 not lesseq to -5/8
$\neg$ \$lesseq$(-1/4, -5/8)$ tff(rat_lesseq_problem$_{11}$, conjecture)

ARI214=1.p Rational: Something lesseq to 0/1
$\exists x$: \$rat: \$lesseq$(x, 0/1)$ tff(rat_lesseq_problem$_{12}$, conjecture)

ARI215=1.p Rational: Something lesseq to -3/5
$\exists x$: \$rat: \$lesseq$(x, -3/5)$ tff(rat_lesseq_problem$_{13}$, conjecture)

ARI216=1.p Rational: -7/16 lesseq to something
$\exists x$: \$rat: \$lesseq$(-7/16, x)$ tff(rat_lesseq_problem$_{14}$, conjecture)

ARI217=1.p Rational: 7/8 greater than 3/4
\$greater$(7/8, 3/4)$ tff(rat_greater_problem$_1$, conjecture)

ARI218=1.p Rational: 3/4 not greater 7/8

$\neg$ \$greater(3/4, 7/8) tff(rat_greater_problem$_2$, conjecture)

ARI219=1.p Rational: 4/15 greather than 1/5
\$greater(4/15, 1/5) tff(rat_greater_problem$_3$, conjecture)

ARI220=1.p Rational: 13/24 greater than something
$\exists x$: \$rat: \$greater(13/24, x) tff(rat_greater_problem$_4$, conjecture)

ARI221=1.p Rational: Something greater than 9/16
$\exists x$: \$rat: \$greater(x, 9/16) tff(rat_greater_problem$_5$, conjecture)

ARI222=1.p Rational: Something greater than something else
$\exists x$: \$rat, y: \$rat: \$greater(x, y) tff(rat_greater_problem$_6$, conjecture)

ARI223=1.p Rational: 13/121 greater than -13/121
\$greater(13/121, $-$13/121) tff(rat_greater_problem$_7$, conjecture)

ARI224=1.p Rational: -17/25 greater than -29/34
\$greater($-$17/25, $-$29/34) tff(rat_greater_problem$_8$, conjecture)

ARI225=1.p Rational: -33/4 not greater than 33/4
$\neg$ \$greater($-$33/4, 33/4) tff(rat_greater_problem$_9$, conjecture)

ARI226=1.p Rational: -29/34 not greater than -17/25
$\neg$ \$greater($-$29/34, $-$17/25) tff(rat_greater_problem$_{10}$, conjecture)

ARI227=1.p Rational: 0/1 greater than something
$\exists x$: \$rat: \$greater(0/1, x) tff(rat_greater_problem$_{11}$, conjecture)

ARI228=1.p Rational: Something greater than -75/112
$\exists x$: \$rat: \$greater(x, $-$75/112) tff(rat_greater_problem$_{12}$, conjecture)

ARI229=1.p Rational: -75/112 greater than something
$\exists x$: \$rat: \$greater($-$75/112, x) tff(rat_greater_problem$_{13}$, conjecture)

ARI230=1.p Rational: 5/12 greatereq to 5/12
\$greatereq(5/12, 5/12) tff(rat_greatereq_problem$_1$, conjecture)

ARI231=1.p Rational: 5/12 greatereq to 1/4
\$greatereq(5/12, 1/4) tff(rat_greatereq_problem$_2$, conjecture)

ARI232=1.p Rational: 1/4 not greatereq 5/12
$\neg$ \$greatereq(1/4, 5/12) tff(rat_greatereq_problem$_3$, conjecture)

ARI233=1.p Rational: 19/25 greatereq to something
$\exists x$: \$rat: \$greatereq(19/25, x) tff(rat_greatereq_problem$_4$, conjecture)

ARI234=1.p Rational: Something greatereq to 3/16
$\exists x$: \$rat: \$greatereq(x, 3/16) tff(rat_greatereq_problem$_5$, conjecture)

ARI235=1.p Rational: Something greatereq something else
$\exists x$: \$rat, y: \$rat: \$greatereq(x, y) tff(rat_greatereq_problem$_6$, conjecture)

ARI236=1.p Rational: -3/4 greatereq to -3/4
\$greatereq($-$3/4, $-$3/4) tff(rat_greatereq_problem$_7$, conjecture)

ARI237=1.p Rational: 3/4 greatereq to -3/4
\$greatereq(3/4, $-$3/4) tff(rat_greatereq_problem$_8$, conjecture)

ARI238=1.p Rational: -1/4 greatereq -5/8
\$greatereq($-$1/4, $-$5/8) tff(rat_greatereq_problem$_9$, conjecture)

ARI239=1.p Rational: -3/4 not greatereq to 3/4
$\neg$ \$greatereq($-$3/4, 3/4) tff(rat_greatereq_problem$_{10}$, conjecture)

ARI240=1.p Rational: -5/8 not greatereq to -1/4
$\neg$ \$greatereq($-$5/8, $-$1/4) tff(rat_greatereq_problem$_{11}$, conjecture)

ARI241=1.p Rational: Something greatereq to 0/1
$\exists x$: \$rat: \$greatereq(x, 0/1) tff(rat_greatereq_problem$_{12}$, conjecture)

ARI242=1.p Rational: -3/5 greatereq to something
$\exists x$: \$rat: \$greatereq($-$3/5, x) tff(rat_greatereq_problem$_{13}$, conjecture)

ARI243=1.p Rational: Something greatereq to -7/16

$\exists x$: \$rat: \$greatereq$(x, -7/16)$ tff(rat_greatereq_problem$_{14}$, conjecture)

ARI244=1.p Rational: 2/5 not equal to 1/16
$2/5 \neq 1/16$ tff(rat_not_equal_problem$_1$, conjecture)

ARI245=1.p Rational: Something not equal to 3/4
$\exists x$: \$rat: $x \neq 3/4$ tff(rat_not_equal_problem$_2$, conjecture)

ARI246=1.p Rational: Sum of 1/2 and 1/4 is 3/4
\$sum$(1/2, 1/4) = 3/4$ tff(rat_sum_problem$_1$, conjecture)

ARI247=1.p Rational: Sum of 2/5 and 3/5 is 1/1
\$sum$(2/5, 3/5) = 1/1$ tff(rat_sum_problem$_2$, conjecture)

ARI248=1.p Rational: Sum of 9/16 and 1/2 is 17/16
\$sum$(9/16, 1/2) = 17/16$ tff(rat_sum_problem$_3$, conjecture)

ARI249=1.p Rational: Sum of 1/1 and 5/8 is 13/8
\$sum$(1/1, 5/8) = 13/8$ tff(rat_sum_problem$_4$, conjecture)

ARI250=1.p Rational: Sum of 17/4 and 23/4 is 10/1
\$sum$(17/4, 23/4) = 10/1$ tff(rat_sum_problem$_5$, conjecture)

ARI251=1.p Rational: Sum of 17/4 and 2/1 is 25/4
\$sum$(17/4, 2/1) = 25/4$ tff(rat_sum_problem$_6$, conjecture)

ARI252=1.p Rational: Sum of 7/2 and 1/2 is 4/1
\$sum$(7/2, 1/2) = 4/1$ tff(rat_sum_problem$_7$, conjecture)

ARI253=1.p Rational: Sum of 17/4 and 2/1 is something
$\exists x$: \$rat: \$sum$(17/4, 2/1) = x$ tff(rat_sum_problem$_8$, conjecture)

ARI254=1.p Rational: Sum of something and 3/16 is 1/2
$\exists x$: \$rat: \$sum$(x, 3/16) = 1/2$ tff(rat_sum_problem$_9$, conjecture)

ARI255=1.p Rational: Sum of 5/16 and something is 1/2
$\exists x$: \$rat: \$sum$(5/16, x) = 1/2$ tff(rat_sum_problem$_{10}$, conjecture)

ARI256=1.p Rational: Sum of 7/2 and 81/20 is not 11/2
\$sum$(7/2, 81/20) \neq 11/2$ tff(rat_sum_problem$_{11}$, conjecture)

ARI257=1.p Rational: Sum of 17/4 and 23/4 is only 10/1
$\forall x$: \$rat: (\$sum$(17/4, 23/4) = x \Rightarrow x = 10/1)$ tff(rat_sum_problem$_{12}$, conjecture)

ARI258=1.p Rational: Sum only 17/4 and 23/4 is 10/1
$\forall x$: \$rat: (\$sum$(x, 23/4) = 10/1 \Rightarrow x = 17/4)$ tff(rat_sum_problem$_{13}$, conjecture)

ARI259=1.p Rational: Sum 17/4 and only 23/4 is 10/1
$\forall x$: \$rat: (\$sum$(17/4, x) = 10/1 \Rightarrow x = 23/4)$ tff(rat_sum_problem$_{14}$, conjecture)

ARI260=1.p Rational: Sum -7/2 and -1/2 is -4/1
\$sum$(-7/2, -1/2) = -4/1$ tff(rat_sum_problem$_{15}$, conjecture)

ARI261=1.p Rational: Sum 17/4 and -23/4 is -3/2
\$sum$(17/4, -23/4) = -3/2$ tff(rat_sum_problem$_{16}$, conjecture)

ARI262=1.p Rational: Sum 5/12 and -1/6 is 1/4
\$sum$(5/12, -1/6) = 1/4$ tff(rat_sum_problem$_{17}$, conjecture)

ARI263=1.p Rational: Sum 3/8 and -3/8 is 0/1
\$sum$(3/8, -3/8) = 0/1$ tff(rat_sum_problem$_{18}$, conjecture)

ARI264=1.p Rational: Sum -1/4 and -1/2 is something
$\exists x$: \$rat: \$sum$(-1/4, -1/2) = x$ tff(rat_sum_problem$_{19}$, conjecture)

ARI265=1.p Rational: Sum 1/4 and -1/2 is something
$\exists y$: \$rat: \$sum$(1/4, -1/2) = y$ tff(rat_sum_problem$_{20}$, conjecture)

ARI266=1.p Rational: Sum 1/2 and -1/4 is something
$\exists x$: \$rat: \$sum$(1/2, -1/4) = x$ tff(rat_sum_problem$_{21}$, conjecture)

ARI267=1.p Rational: Sum 1/2 and -1/2 is something
$\exists x$: \$rat: \$sum$(1/2, -1/2) = x$ tff(rat_sum_problem$_{22}$, conjecture)

ARI268=1.p Rational: Sum something and -7/2 is -11/2

$\exists x$: \$rat: \$sum$(x, -7/2) = -11/2$ tff(rat_sum_problem$_{23}$, conjecture)

ARI269=1.p Rational: Sum something -11/2 is -13/2
$\exists x$: \$rat: \$sum$(x, -11/2) = -13/2$ tff(rat_sum_problem$_{24}$, conjecture)

ARI270=1.p Rational: Sum something and -5/2 is 7/2
$\exists x$: \$rat: \$sum$(x, -5/2) = 7/2$ tff(rat_sum_problem$_{25}$, conjecture)

ARI271=1.p Rational: Sum something and -12/119 is 0/1
$\exists x$: \$rat: \$sum$(x, -12/119) = 0/1$ tff(rat_sum_problem$_{26}$, conjecture)

ARI272=1.p Rational: Sum something and 0/1 is something
$\exists x$: \$rat: \$sum$(x, 0/1) = x$ tff(rat_sum_problem$_{27}$, conjecture)

ARI273=1.p Rational: Difference 7/8 and 3/8 is 1/2
\$difference$(7/8, 3/8) = 1/2$ tff(rat_difference_problem$_1$, conjecture)

ARI274=1.p Rational: Difference 5/12 and 1/2 is -1/12
\$difference$(5/12, 1/2) = -1/12$ tff(rat_difference_problem$_2$, conjecture)

ARI275=1.p Rational: Difference 90/117 and 25/117 is 5/9
\$difference$(90/117, 25/117) = 5/9$ tff(rat_difference_problem$_3$, conjecture)

ARI276=1.p Rational: Difference -1/8 and 3/16 is -5/16
\$difference$(-1/8, 3/16) = -5/16$ tff(rat_difference_problem$_4$, conjecture)

ARI277=1.p Rational: Difference 4/7 and -3/7 is 1/1
\$difference$(4/7, -3/7) = 1/1$ tff(rat_difference_problem$_5$, conjecture)

ARI278=1.p Rational: Difference 5/12 and 1/12 is only 1/3
$\forall x$: \$rat: (\$difference$(5/12, 1/12) = x \Rightarrow x = 1/3)$ tff(rat_difference_problem$_6$, conjecture)

ARI279=1.p Rational: Difference only 1/2 and 3/16 is 5/16
$\forall x$: \$rat: (\$difference$(x, 3/16) = 5/16 \Rightarrow x = 1/2)$ tff(rat_difference_problem$_7$, conjecture)

ARI280=1.p Rational: Difference 5/2 and only 5/8 is 15/8
$\forall x$: \$rat: (\$difference$(5/2, x) = 15/8 \Rightarrow x = 5/8)$ tff(rat_difference_problem$_8$, conjecture)

ARI281=1.p Rational: Difference something and 0/1 is something
$\exists x$: \$rat: \$difference$(x, 0/1) = x$ tff(rat_difference_problem$_9$, conjecture)

ARI282=1.p Rational: Difference 5/12 and 1/12 is 1/3 in a predicate
p: \$rat $\rightarrow$ \$o tff(p_type, type)
p(\$difference$(5/12, 1/12)) \Rightarrow p(1/3)$ tff(rat_difference_problem$_{10}$, conjecture)

ARI283=1.p Rational: Difference -7/8 and 3/8 is something
$\exists x$: \$rat: \$difference$(-7/8, 3/8) = x$ tff(rat_difference_problem$_{11}$, conjecture)

ARI284=1.p Rational: Product 1/3 and 3/4 is 1/4
\$product$(1/3, 3/4) = 1/4$ tff(rat_product_problem$_1$, conjecture)

ARI285=1.p Rational: Problem 3/8 and 7/10 is 21/80
\$product$(3/8, 7/10) = 21/80$ tff(rat_product_problem$_2$, conjecture)

ARI286=1.p Rational: Problem 3/8 and 5/12 is 5/32
\$product$(3/8, 5/12) = 5/32$ tff(rat_product_problem$_3$, conjecture)

ARI287=1.p Rational: Product 2/5 and 9/1 is 18/5
\$product$(2/5, 9/1) = 18/5$ tff(rat_product_problem$_4$, conjecture)

ARI288=1.p Rational: Product 12/5 and 7/1 is 84/5
\$product$(12/5, 7/1) = 84/5$ tff(rat_product_problem$_5$, conjecture)

ARI289=1.p Rational: Product -5/2 and 17/5 is -17/2
\$product$(-5/2, 17/5) = -17/2$ tff(rat_product_problem$_6$, conjecture)

ARI290=1.p Rational: Product -3/40 and -12/1 is 9/10
\$product$(-3/40, -12/1) = 9/10$ tff(rat_product_problem$_7$, conjecture)

ARI291=1.p Rational: Product 11/2 and 11/2 is 121/4
\$product$(11/2, 11/2) = 121/4$ tff(rat_product_problem$_8$, conjecture)

ARI292=1.p Rational: Product 11/2 and 11/2 is something
$\exists x$: \$rat: \$product$(11/2, 11/2) = x$ tff(rat_product_problem$_9$, conjecture)

ARI293=1.p Rational: Product something and 11/2 is 121/4
$\exists x$: \$rat: \$product$(x, 11/2) = 121/4$ tff(rat_product_problem$_{10}$, conjecture)

ARI294=1.p Rational: Product 11/2 and something is 121/4
$\exists x$: \$rat: \$product$(11/2, x) = 121/4$ tff(rat_product_problem$_{11}$, conjecture)

ARI295=1.p Rational: Product 5/8 and 7/8 is not 9/16
\$product$(5/8, 7/8) \neq 9/16$ tff(rat_product_problem$_{12}$, conjecture)

ARI296=1.p Rational: Product 5/8 and 2/5 is only 1/4
$\forall x$: \$rat: (\$product$(5/8, 2/5) = x \Rightarrow x = 1/4$) tff(rat_product_problem$_{13}$, conjecture)

ARI297=1.p Rational: Product only 5/8 and 2/5 is 1/4
$\forall x$: \$rat: (\$product$(x, 2/5) = 1/4 \Rightarrow x = 5/8$) tff(rat_product_problem$_{14}$, conjecture)

ARI298=1.p Rational: Product 5/8 and only 2/5 is 1/4
$\forall x$: \$rat: (\$product$(5/8, x) = 1/4 \Rightarrow x = 2/5$) tff(rat_product_problem$_{15}$, conjecture)

ARI299=1.p Rational: Product -18/25 and -1/4 is 9/50
\$product$(-18/25, -1/4) = 9/50$ tff(rat_product_problem$_{16}$, conjecture)

ARI300=1.p Rational: Product 1/4 and 18/25 is -9/50
\$product$(1/4, -18/25) = -9/50$ tff(rat_product_problem$_{17}$, conjecture)

ARI301=1.p Rational: Product 18/25 and -1/4 is -9/50
\$product$(18/25, -1/4) = -9/50$ tff(rat_product_problem$_{18}$, conjecture)

ARI302=1.p Rational: Product 1/20 and 0/1 is 0/1
\$product$(1/20, 0/1) = 0/1$ tff(rat_product_problem$_{19}$, conjecture)

ARI303=1.p Rational: Product -15/16 and -4/5 is 3/4
$\exists x$: \$rat: \$product$(-15/16, -4/5) = 3/4$ tff(rat_product_problem$_{20}$, conjecture)

ARI304=1.p Rational: Product 15/16 and -4/5 is something
$\exists y$: \$rat: \$product$(15/16, -4/5) = y$ tff(rat_product_problem$_{21}$, conjecture)

ARI305=1.p Rational: Product 4/5 and -15/16 is something
$\exists x$: \$rat: \$product$(4/5, -15/16) = x$ tff(rat_product_problem$_{22}$, conjecture)

ARI306=1.p Rational: Product something and -4/5 is -3/4
$\exists x$: \$rat: \$product$(x, -4/5) = -3/4$ tff(rat_product_problem$_{23}$, conjecture)

ARI307=1.p Rational: Product something and -4/5 is 3/4
$\exists x$: \$rat: \$product$(x, -4/5) = 3/4$ tff(rat_product_problem$_{24}$, conjecture)

ARI308=1.p Rational: -17/25 is - 17/25
$-17/25 =$ \$uminus(17/25) tff(rat_uminus_problem$_1$, conjecture)

ARI309=1.p Rational: 2/3 is - -2/3
$2/3 =$ \$uminus$(-2/3)$ tff(rat_uminus_problem$_2$, conjecture)

ARI310=1.p Rational: Sum 129/503 and - 129/503 is 0/1
\$sum(129/503, \$uminus(129/503)) $= 0/1$ tff(rat_uminus_problem$_3$, conjecture)

ARI311=1.p Rational: Sum -226/25 and - -226/25 is 0/1
\$sum$(-226/25$, \$uminus$(-226/25)) = 0/1$ tff(rat_uminus_problem$_4$, conjecture)

ARI312=1.p Rational: - - 3/4 is 3/4
\$uminus(\$uminus(3/4)) $= 3/4$ tff(rat_uminus_problem$_5$, conjecture)

ARI313=1.p Rational: - - -31/8 is -31/8
\$uminus(\$uminus$(-31/8)) = -31/8$ tff(rat_uminus_problem$_6$, conjecture)

ARI337=1.p Rational: Sum is 36/5 and difference is 0/1
$\exists x$: \$rat, y: \$rat: \$sum$(x, y) = 36/(5$ and (\$difference$(x, y) = 0/1$)) tff(rat_combined_problem$_3$, conjecture)

ARI338=1.p Rational: Something less than sum something and 1/1
$\exists x$: \$rat, y: \$rat: (\$sum$(x, 1/1) = y$ and \$less(x, y)) tff(rat_combined_problem$_4$, conjecture)

ARI339=1.p Rational: Sum of 12/5 and 37/10 is less than 7/1
$\forall x$: \$rat: (\$sum$(12/5, 37/10) = x \Rightarrow$ \$less$(x, 7/1)$) tff(rat_combined_problem$_5$, conjecture)

ARI340=1.p Rational: 15/2 is less than sum of 29/10 and 24/5
$\forall x$: \$rat: (\$sum$(29/10, 24/5) = x \Rightarrow$ \$less$(15/2, x)$) tff(rat_combined_problem$_6$, conjecture)

ARI341=1.p Rational: -2/5 * (145/2 - 569/5) less than (- 76/25) + 271/10
p: \$rat → \$o tff(p_type, type)
$\$\mathrm{less}(\$\mathrm{product}(-2/5, \$\mathrm{difference}(145/2, 569/5)), \$\mathrm{sum}(\$\mathrm{uminus}(76/25), 271/10))$ tff(rat_combined_problem$_{7}$, conjecture)

ARI342=1.p Rational: Sum of something and itself less than -13/2
$\exists x$: \$rat: $\$\mathrm{less}(\$\mathrm{sum}(x, x), -13/2)$ tff(rat_combined_problem$_{8}$, conjecture)

ARI343=1.p Rational: (Something * 16/5) + -3/4 less than -64/5
$\exists x$: \$rat: $\$\mathrm{less}(\$\mathrm{sum}(\$\mathrm{product}(x, 16/5), -3/4), -64/5)$ tff(rat_combined_problem$_{9}$, conjecture)

ARI344=1.p Rational: (16/5 * something) + (34/5 * something else) is 273/25
$\exists x$: \$rat, y: \$rat: $\$\mathrm{sum}(\$\mathrm{product}(16/5, x), \$\mathrm{product}(34/5, y)) = 273/25$ tff(rat_combined_problem$_{10}$, conjecture)

ARI345=1.p Real: 2.5 less than 3.0
$\$\mathrm{less}(2._{5}, 3._{0})$ tff(real_less_problem$_{1}$, conjecture)

ARI346=1.p Real: 3.0 not less than 2.5
$\neg\,\$\mathrm{less}(3._{0}, 2._{5})$ tff(real_less_problem$_{2}$, conjecture)

ARI347=1.p Real: 9.53 less than 9.58
$\$\mathrm{less}(9._{53}, 9._{58})$ tff(real_less_problem$_{3}$, conjecture)

ARI348=1.p Real: Something less than 12.8
$\exists x$: \$real: $\$\mathrm{less}(x, 12._{8})$ tff(real_less_problem$_{4}$, conjecture)

ARI349=1.p Real: 7.0 less than something
$\exists x$: \$real: $\$\mathrm{less}(7._{0}, x)$ tff(real_less_problem$_{5}$, conjecture)

ARI350=1.p Real: Something less than something else
$\exists x$: \$real, y: \$real: $\$\mathrm{less}(x, y)$ tff(real_less_problem$_{6}$, conjecture)

ARI351=1.p Real: -3.25 less than 3.25
$\$\mathrm{less}(-3._{25}, 3._{25})$ tff(real_less_problem$_{7}$, conjecture)

ARI352=1.p Real: -8.68 less than 3.25
$\$\mathrm{less}(-8._{69}, -3._{25})$ tff(real_less_problem$_{8}$, conjecture)

ARI353=1.p Real: 3.25 not less than -3.25
$\neg\,\$\mathrm{less}(3._{25}, -3._{25})$ tff(real_less_problem$_{9}$, conjecture)

ARI354=1.p Real: -3.25 not less than -8.69
$\neg\,\$\mathrm{less}(-3._{25}, -8._{69})$ tff(real_less_problem$_{10}$, conjecture)

ARI355=1.p Real: Something less than 0.0
$\exists x$: \$real: $\$\mathrm{less}(x, 0._{0})$ tff(real_less_problem$_{11}$, conjecture)

ARI356=1.p Real: Something less than -32500.0
$\exists x$: \$real: $\$\mathrm{less}(x, -32500._{0})$ tff(real_less_problem$_{12}$, conjecture)

ARI357=1.p Real: -32500.0 less than something
$\exists x$: \$real: $\$\mathrm{less}(-32500._{0}, x)$ tff(real_less_problem$_{13}$, conjecture)

ARI358=1.p Real: 3.25 lesseq to 3.25
$\$\mathrm{lesseq}(3._{25}, 3._{25})$ tff(real_lesseq_problem$_{1}$, conjecture)

ARI359=1.p Real: 3.25 lesseq to 7.8
$\$\mathrm{lesseq}(3._{25}, 7._{8})$ tff(real_lesseq_problem$_{2}$, conjecture)

ARI360=1.p Real: 7.8 not lesseq to 3.25
$\neg\,\$\mathrm{lesseq}(7._{8}, 3._{25})$ tff(real_lesseq_problem$_{3}$, conjecture)

ARI361=1.p Real: Something lesseq to 14.68
$\exists x$: \$real: $\$\mathrm{lesseq}(x, 14._{68})$ tff(real_lesseq_problem$_{4}$, conjecture)

ARI362=1.p Real: 11.33 lesseq to something
$\exists x$: \$real: $\$\mathrm{lesseq}(11._{33}, x)$ tff(real_lesseq_problem$_{5}$, conjecture)

ARI363=1.p Real: Something lesseq to something else
$\exists x$: \$real, y: \$real: $\$\mathrm{lesseq}(x, y)$ tff(real_lesseq_problem$_{6}$, conjecture)

ARI364=1.p Real: -3.25 lesseq to -3.25
$\$\mathrm{lesseq}(-3._{25}, -3._{25})$ tff(real_lesseq_problem$_{7}$, conjecture)

ARI365=1.p Real: -3.25 lesseq to 3.25

$\$lesseq(-3._{25}, 3._{25})$ tff(real_lesseq_problem$_8$, conjecture)

ARI366=1.p Real: -8.69 lesseq to -3.25
$\$lesseq(-8._{69}, -3._{25})$ tff(real_lesseq_problem$_9$, conjecture)

ARI367=1.p Real: 3.25 not lesseq to -3.25
$\neg \$lesseq(3._{25}, -3._{25})$ tff(real_lesseq_problem$_{10}$, conjecture)

ARI368=1.p Real: -3.25 not lesseq to -8.69
$\neg \$lesseq(-3._{25}, -8._{69})$ tff(real_lesseq_problem$_{11}$, conjecture)

ARI369=1.p Real: Something lesseq to 0.0
$\exists x$: \$real: $\$lesseq(x, 0._0)$ tff(real_lesseq_problem$_{12}$, conjecture)

ARI370=1.p Real: Something lesseq to -3.25
$\exists x$: \$real: $\$lesseq(x, -3._{25})$ tff(real_lesseq_problem$_{13}$, conjecture)

ARI371=1.p Real: -3.25 lesseq to something
$\exists x$: \$real: $\$lesseq(-3._{25}, x)$ tff(real_lesseq_problem$_{14}$, conjecture)

ARI372=1.p Real: 3.0 greater than 2.5
$\$greater(3._0, 2._5)$ tff(real_greater_problem$_1$, conjecture)

ARI373=1.p Real: 2.5 not greater than 3.0
$\neg \$greater(2._5, 3._0)$ tff(real_greater_problem$_2$, conjecture)

ARI374=1.p Real: 9.58 greater than 9.53
$\$greater(9._{58}, 9._{53})$ tff(real_greater_problem$_3$, conjecture)

ARI375=1.p Real: 12.8 greater than something
$\exists x$: \$real: $\$greater(12._8, x)$ tff(real_greater_problem$_4$, conjecture)

ARI376=1.p Real: Something greater than 7.0
$\exists x$: \$real: $\$greater(x, 7._0)$ tff(real_greater_problem$_5$, conjecture)

ARI377=1.p Real: Something greater than something else
$\exists x$: \$real, y: \$real: $\$greater(x, y)$ tff(real_greater_problem$_6$, conjecture)

ARI378=1.p Real: 3.25 greater then -3.25
$\$greater(3._{25}, -3._{25})$ tff(real_greater_problem$_7$, conjecture)

ARI379=1.p Real: -3.25 greater than -8.69
$\$greater(-3._{25}, -8._{69})$ tff(real_greater_problem$_8$, conjecture)

ARI380=1.p Real: -3.25 not greater than 3.25
$\neg \$greater(-3._{25}, 3._{25})$ tff(real_greater_problem$_9$, conjecture)

ARI381=1.p Real: -8.69 not greater than -3.25
$\neg \$greater(-8._{69}, -3._{25})$ tff(real_greater_problem$_{10}$, conjecture)

ARI382=1.p Real: 0.0 greater than something
$\exists x$: \$real: $\$greater(0._0, x)$ tff(real_greater_problem$_{11}$, conjecture)

ARI383=1.p Real: -32500.0 greater than something
$\exists x$: \$real: $\$greater(-32500._0, x)$ tff(real_greater_problem$_{12}$, conjecture)

ARI384=1.p Real: Something greater than -32500.0
$\exists x$: \$real: $\$greater(x, -32500._0)$ tff(real_greater_problem$_{13}$, conjecture)

ARI385=1.p Real: 3.25 greatereq to 3.25
$\$greatereq(3._{25}, 3._{25})$ tff(real_greatereq_problem$_1$, conjecture)

ARI386=1.p Real: 7.8 greatereq to 3.25
$\$greatereq(7._8, 3._{25})$ tff(real_greatereq_problem$_2$, conjecture)

ARI387=1.p Real: 3.25 not greatereq to 7.8
$\neg \$greatereq(3._{25}, 7._8)$ tff(real_greatereq_problem$_3$, conjecture)

ARI388=1.p Real: 14.68 greatereq to something
$\exists x$: \$real: $\$greatereq(14._{68}, x)$ tff(real_greatereq_problem$_4$, conjecture)

ARI389=1.p Real: Something greatereq to 11.33
$\exists x$: \$real: $\$greatereq(x, 11._{33})$ tff(real_greatereq_problem$_5$, conjecture)

ARI390=1.p Real: Something greatereq to something else

$\exists x$: \$real, y: \$real: \$greatereq(x, y) tff(real_greatereq_problem$_6$, conjecture)

ARI391=1.p Real: -3.25 greatereq to -3.25
\$greatereq$(-3._{25}, -3._{25})$ tff(real_greatereq_problem$_7$, conjecture)

ARI392=1.p Real: 3.25 greatereq to -3.25
\$greatereq$(3._{25}, -3._{25})$ tff(real_greatereq_problem$_8$, conjecture)

ARI393=1.p Real: -3.25 greatereq to -8.69
\$greatereq$(-3._{25}, -8._{69})$ tff(real_greatereq_problem$_9$, conjecture)

ARI394=1.p Real: -3.25 not greatereq to 3.25
$\neg$ \$greatereq$(-3._{25}, 3._{25})$ tff(real_greatereq_problem$_{10}$, conjecture)

ARI395=1.p Real: -8.69 not greatereq to -3.25
$\neg$ \$greatereq$(-8._{69}, -3._{25})$ tff(real_greatereq_problem$_{11}$, conjecture)

ARI396=1.p Real: Something greatereq to 0.0
$\exists x$: \$real: \$greatereq$(x, 0._0)$ tff(real_greatereq_problem$_{12}$, conjecture)

ARI397=1.p Real: -3.25 greatereq to something
$\exists x$: \$real: \$greatereq$(-3._{25}, x)$ tff(real_greatereq_problem$_{13}$, conjecture)

ARI398=1.p Real: Something greatereq to -3.25
$\exists x$: \$real: \$greatereq$(x, -3._{25})$ tff(real_greatereq_problem$_{14}$, conjecture)

ARI399=1.p Real: 14.75 is not 9.69
$14._{75} \neq 9._{69}$ tff(real_not_equal_problem$_1$, conjecture)

ARI400=1.p Real: Something is not 20.06
$\exists x$: \$real: $x \neq 20._{06}$ tff(real_not_equal_problem$_2$, conjecture)

ARI401=1.p Real: Sum 4.0 and 5.0 is 9.0
\$sum$(4._0, 5._0) = 9._0$ tff(real_sum_problem$_1$, conjecture)

ARI402=1.p Real: Sum 4.25 and 5.75 is 10.0
\$sum$(4._{25}, 5._{75}) = 10._0$ tff(real_sum_problem$_2$, conjecture)

ARI403=1.p Real: Sum 4.25 and 2.0 is 6.25
\$sum$(4._{25}, 2._0) = 6._{25}$ tff(real_sum_problem$_3$, conjecture)

ARI404=1.p Real: Sum 3.5 and 2.05 is 5.55
\$sum$(3._5, 2._{05}) = 5._{55}$ tff(real_sum_problem$_4$, conjecture)

ARI405=1.p Real: Sum 4.25 and 2.0 is something
$\exists x$: \$real: \$sum$(4._{25}, 2._0) = x$ tff(real_sum_problem$_5$, conjecture)

ARI406=1.p Real: Sum something and 4.07 is 19.076
$\exists x$: \$real: \$sum$(x, 4._{07}) = 19._{076}$ tff(real_sum_problem$_6$, conjecture)

ARI407=1.p Real: Sum 4.25 and something is 10.0
$\exists x$: \$real: \$sum$(4._{25}, x) = 10._0$ tff(real_sum_problem$_7$, conjecture)

ARI408=1.p Real: Sum 3.5 and 2.05 is not 5.5
\$sum$(3._5, 2._{05}) \neq 5._5$ tff(real_sum_problem$_8$, conjecture)

ARI409=1.p Real: Sum 4.25 and 5.75 is only 10.0
$\forall x$: \$real: (\$sum$(4._{25}, 5._{75}) = x \;\Rightarrow\; x = 10._0)$ tff(real_sum_problem$_9$, conjecture)

ARI410=1.p Real: Sum only 4.25 and 5.75 is 10.0
$\forall x$: \$real: (\$sum$(x, 5._{75}) = 10._0 \;\Rightarrow\; x = 4._{25})$ tff(real_sum_problem$_{10}$, conjecture)

ARI411=1.p Real: Sum 4.25 and only 5.75 is 10.0
$\forall x$: \$real: (\$sum$(4._{25}, x) = 10._0 \;\Rightarrow\; x = 5._{75})$ tff(real_sum_problem$_{11}$, conjecture)

ARI412=1.p Real: Sum -3.5 and -0.5 is -4.0
\$sum$(-3._5, -0._5) = -4._0$ tff(real_sum_problem$_{12}$, conjecture)

ARI413=1.p Real: Sum 4.25 and -5.75 is -1.5
\$sum$(4._{25}, -5._{75}) = -1._5$ tff(real_sum_problem$_{13}$, conjecture)

ARI414=1.p Real: Sum 5.55 and -3.05 is 2.5
\$sum$(5._{55}, -3._{05}) = 2._5$ tff(real_sum_problem$_{14}$, conjecture)

ARI415=1.p Real: Sum 14.65 and -14.65 is 0.0

$\$sum(14._{65}, -14._{65}) = 0._0$ tff(real_sum_problem$_{15}$, conjecture)

ARI416=1.p Real: Sum -2.05 and -3.5 is something
$\exists x$: \$real: $\$sum(-2._{05}, -3._5) = x$ tff(real_sum_problem$_{16}$, conjecture)

ARI417=1.p Real: Sum 2.05 and -3.5 is something
$\exists y$: \$real: $\$sum(2._{05}, -3._5) = y$ tff(real_sum_problem$_{17}$, conjecture)

ARI418=1.p Real: Sum 3.5 and -2.05 is something
$\exists x$: \$real: $\$sum(3._5, -2._{05}) = x$ tff(real_sum_problem$_{18}$, conjecture)

ARI419=1.p Real: Sum 3.5 and -3.5 is something
$\exists x$: \$real: $\$sum(3._5, -3._5) = x$ tff(real_sum_problem$_{19}$, conjecture)

ARI420=1.p Real: Sum something and -3.5 is -5.55
$\exists x$: \$real: $\$sum(x, -3._5) = -5._{55}$ tff(real_sum_problem$_{20}$, conjecture)

ARI421=1.p Real: Sum something and -3.5 is -6.5
$\exists x$: \$real: $\$sum(x, -3._5) = -6._5$ tff(real_sum_problem$_{21}$, conjecture)

ARI422=1.p Real: Sum something and -2.05 is 3.5
$\exists x$: \$real: $\$sum(x, -2._{05}) = 3._5$ tff(real_sum_problem$_{22}$, conjecture)

ARI423=1.p Real: Sum something and -3500000.0 is 0.0
$\exists x$: \$real: $\$sum(x, -3500000._0) = 0._0$ tff(real_sum_problem$_{23}$, conjecture)

ARI424=1.p Real: Sum something and 0.0 is itself
$\exists x$: \$real: $\$sum(x, 0._0) = x$ tff(real_sum_problem$_{24}$, conjecture)

ARI425=1.p Real: Difference 9.0 and 4.0 is 5.0
$\$difference(9._0, 4._0) = 5._0$ tff(real_difference_problem$_1$, conjecture)

ARI426=1.p Real: Difference 10.0 and 5.75 is 4.25
$\$difference(10._0, 5._{75}) = 4._{25}$ tff(real_difference_problem$_2$, conjecture)

ARI427=1.p Real: Difference 6.25 and 4.25 is 2.0
$\$difference(6._{25}, 4._{25}) = 2._0$ tff(real_difference_problem$_3$, conjecture)

ARI428=1.p Real: Difference 5.55 and 3.5 is 2.05
$\$difference(5._{55}, 3._5) = 2._{05}$ tff(real_difference_problem$_4$, conjecture)

ARI429=1.p Real: Difference 7.48 and 0.65 is 6.83
$\$difference(7._{48}, 0._{65}) = 6._{83}$ tff(real_difference_problem$_5$, conjecture)

ARI430=1.p Real: Difference 23.76 and 9.51 is only 14.25
$\forall x$: \$real: $(\$difference(23._{76}, 9._{51}) = x \Rightarrow x = 14._{25})$ tff(real_difference_problem$_6$, conjecture)

ARI431=1.p Real: Difference only 16.05 and 12.05 is 4.0
$\forall x$: \$real: $(\$difference(x, 12._{05}) = 4._0 \Rightarrow x = 16._{05})$ tff(real_difference_problem$_7$, conjecture)

ARI432=1.p Real: Difference 16.05 and only 4.0 is 12.05
$\forall x$: \$real: $(\$difference(16._{05}, x) = 12._{05} \Rightarrow x = 4._0)$ tff(real_difference_problem$_8$, conjecture)

ARI433=1.p Real: Difference something and 0.0 is itself
$\exists x$: \$real: $\$difference(x, 0._0) = x$ tff(real_difference_problem$_9$, conjecture)

ARI434=1.p Real: Difference 5.8 and 0.3 is 5.5 in a predicate
p: \$real → \$o tff(p_type, type)
$p(\$difference(5._8, 0._3)) \Rightarrow p(5._5)$ tff(real_difference_problem$_{10}$, conjecture)

ARI435=1.p Real: Difference -1.28 and 1.0 is something
$\exists x$: \$real: $\$difference(-1._{28}, 1._0) = x$ tff(real_difference_problem$_{11}$, conjecture)

ARI436=1.p Real: Product 3.0 and 4.0 is 12.0
$\$product(3._0, 4._0) = 12._0$ tff(real_product_problem$_1$, conjecture)

ARI437=1.p Real: Product 3.0 and 2.4 is 7.2
$\$product(3._0, 2._4) = 7._2$ tff(real_product_problem$_2$, conjecture)

ARI438=1.p Real: Product 2.38 and 1.5 is 3.57
$\$product(2._{38}, 1._5) = 3._{57}$ tff(real_product_problem$_3$, conjecture)

ARI439=1.p Real: Product 2.4 and 7.0 is 16.8
$\$product(2._4, 7._0) = 16._8$ tff(real_product_problem$_4$, conjecture)

ARI440=1.p Real: Product -2.5 and 3.4 is -8.5
$\$\text{product}(-2._5, 3._4) = -8._5 \qquad \text{tff}(\text{real\_product\_problem}_5, \text{conjecture})$

ARI441=1.p Real: Product -0.075 and -12.0 is 0.9
$\$\text{product}(-0._{075}, -12._0) = 0._9 \qquad \text{tff}(\text{real\_product\_problem}_6, \text{conjecture})$

ARI442=1.p Real: Product 5.5 and 5.5 is 30.25
$\$\text{product}(5._5, 5._5) = 30._{25} \qquad \text{tff}(\text{real\_product\_problem}_7, \text{conjecture})$

ARI443=1.p Real: Product 5.5 and 5.5 is something
$\exists x$: \$real: $\$\text{product}(5._5, 5._5) = x \qquad \text{tff}(\text{real\_product\_problem}_8, \text{conjecture})$

ARI444=1.p Real: Product something and 5.5 is 30.25
$\exists x$: \$real: $\$\text{product}(x, 5._5) = 30._{25} \qquad \text{tff}(\text{real\_product\_problem}_9, \text{conjecture})$

ARI445=1.p Real: Product 5.5 and something is 30.25
$\exists x$: \$real: $\$\text{product}(5._5, x) = 30._{25} \qquad \text{tff}(\text{real\_product\_problem}_{10}, \text{conjecture})$

ARI446=1.p Real: Product 5000.0 and 2.5 is not 12000.0
$\$\text{product}(5000._0, 2._5) \neq 12000._0 \qquad \text{tff}(\text{real\_product\_problem}_{11}, \text{conjecture})$

ARI447=1.p Real: Product 7.25 and 4.0 is only 29.0
$\forall x$: \$real: $(\$\text{product}(7._{25}, 4._0) = x \Rightarrow x = 29._0) \qquad \text{tff}(\text{real\_product\_problem}_{12}, \text{conjecture})$

ARI448=1.p Real: Product only 7.25 and 4.0 is 29.0
$\forall x$: \$real: $(\$\text{product}(x, 4._0) = 29._0 \Rightarrow x = 7._{25}) \qquad \text{tff}(\text{real\_product\_problem}_{13}, \text{conjecture})$

ARI449=1.p Real: Product 7.25 and only 4.0 is 29.0
$\forall x$: \$real: $(\$\text{product}(7._{25}, x) = 29._0 \Rightarrow x = 4._0) \qquad \text{tff}(\text{real\_product\_problem}_{14}, \text{conjecture})$

ARI450=1.p Real: Product -0.05 and -70.4 is 3.52
$\$\text{product}(-0._{05}, -70._4) = 3._{52} \qquad \text{tff}(\text{real\_product\_problem}_{15}, \text{conjecture})$

ARI451=1.p Real: Product 0.05 and -70.4 is -3.52
$\$\text{product}(0._{05}, -70._4) = -3._{52} \qquad \text{tff}(\text{real\_product\_problem}_{16}, \text{conjecture})$

ARI452=1.p Real: Product 70.4 and -0.05 is -3.52
$\$\text{product}(70._4, -0._{05}) = -3._{52} \qquad \text{tff}(\text{real\_product\_problem}_{17}, \text{conjecture})$

ARI453=1.p Real: Product 0.05 and 0.0 is 0.0
$\$\text{product}(0._{05}, 0._0) = 0._0 \qquad \text{tff}(\text{real\_product\_problem}_{18}, \text{conjecture})$

ARI454=1.p Real: Product -14.25 and -0.08 is 1.14
$\$\text{product}(-14._{25}, -0._{08}) = 1._{14} \qquad \text{tff}(\text{real\_product\_problem}_{19}, \text{conjecture})$

ARI455=1.p Real: Product 14.25 and -0.08 is something
$\exists y$: \$real: $\$\text{product}(14._{25}, -0._{08}) = y \qquad \text{tff}(\text{real\_product\_problem}_{20}, \text{conjecture})$

ARI456=1.p Real: Product 0.08 and -14.25 is something
$\exists x$: \$real: $\$\text{product}(0._{08}, -14._{25}) = x \qquad \text{tff}(\text{real\_product\_problem}_{21}, \text{conjecture})$

ARI457=1.p Real: Product something and -0.08 is -1.14
$\exists x$: \$real: $\$\text{product}(x, -0._{08}) = -1._{14} \qquad \text{tff}(\text{real\_product\_problem}_{22}, \text{conjecture})$

ARI458=1.p Real: Product something and -0.08 is 1.14
$\exists x$: \$real: $\$\text{product}(x, -0._{08}) = 1._{14} \qquad \text{tff}(\text{real\_product\_problem}_{23}, \text{conjecture})$

ARI459=1.p Real: -3.25 is - 3.25
$-3._{25} = \$\text{uminus}(3._{25}) \qquad \text{tff}(\text{real\_uminus\_problem}_1, \text{conjecture})$

ARI460=1.p Real: 0.6 is - -0.6
$0._6 = \$\text{uminus}(-0._6) \qquad \text{tff}(\text{real\_uminus\_problem}_2, \text{conjecture})$

ARI461=1.p Real: Sum 11.38 and - 11.38 is 0.0
$\$\text{sum}(11._{38}, \$\text{uminus}(11._{38})) = 0._0 \qquad \text{tff}(\text{real\_uminus\_problem}_3, \text{conjecture})$

ARI462=1.p Real: Sum -9.04 and - -9.04 is 0.0
$\$\text{sum}(-9._{04}, \$\text{uminus}(-9._{04})) = 0._0 \qquad \text{tff}(\text{real\_uminus\_problem}_4, \text{conjecture})$

ARI463=1.p Real: - - 0.75 is 0.75
$\$\text{uminus}(\$\text{uminus}(0._{75})) = 0._{75} \qquad \text{tff}(\text{real\_uminus\_problem}_5, \text{conjecture})$

ARI464=1.p Real: - - -70.4 is -70.4
$\$\text{uminus}(\$\text{uminus}(-70._4)) = -70._4 \qquad \text{tff}(\text{real\_uminus\_problem}_6, \text{conjecture})$

ARI488=1.p Real: Sum is 7.2 and difference is 0.0
$\exists x$: \$real, y: \$real: (\$sum$(x, y) = 7._2$ and \$difference$(x, y) = 0._0$) tff(real_combined_problem$_3$, conjecture)

ARI489=1.p Real: Something less than sum something and 1
$\exists x$: \$real, y: \$real: (\$sum$(x, 1._0) = y$ and \$less(x, y)) tff(real_combined_problem$_4$, conjecture)

ARI490=1.p Real: Sum 2.4 and 3.7 is less than 7.0
$\forall x$: \$real: (\$sum$(2._4, 3._7) = x \Rightarrow$ \$less$(x, 7._0)$) tff(real_combined_problem$_5$, conjecture)

ARI491=1.p Real: 7.5 is less than sum 2.9 and 4.8
$\forall x$: \$real: (\$sum$(2._9, 4._8) = x \Rightarrow$ \$less$(7._5, x)$) tff(real_combined_problem$_6$, conjecture)

ARI492=1.p Real: -0.4 * (72.5 - 113.8) is less than (- 3.04) + 27.1
\$less(\$product$(-0._4$, \$difference$(72._5, 113._8)$), \$sum(\$uminus$(3._{04}), 27._1)$) tff(real_combined_problem$_7$, conjecture)

ARI493=1.p Real: Sum something and iteself is less than -6.5
$\exists x$: \$real: \$less(\$sum$(x, x), -6._5$) tff(real_combined_problem$_8$, conjecture)

ARI494=1.p Real: (Something * 3.2) + -0.75 is less than -12.8
$\exists x$: \$real: \$less(\$sum(\$product$(x, 3._2), -0._{75}), -12._8$) tff(real_combined_problem$_9$, conjecture)

ARI495=1.p Real: (3.2 * something) + (6.8 * something else) is 10.92
$\exists x$: \$real, y: \$real: \$sum(\$product$(3._2, x)$, \$product$(6._8, y)) = 10._{92}$ tff(real_combined_problem$_{10}$, conjecture)

ARI496=1.p Mixed: 6 is an integer
\$is_int(6) tff(mixed_types_problem$_1$, conjecture)

ARI497=1.p Mixed: 17.0 is an integer
\$is_int($17._0$) tff(mixed_types_problem$_2$, conjecture)

ARI498=1.p Mixed: 7/12 is not an integer
$\neg$ \$is_int(7/12) tff(mixed_types_problem$_3$, conjecture)

ARI499=1.p Mixed: 9.75 is not an integer
$\neg$ \$is_int($9._{75}$) tff(mixed_types_problem$_4$, conjecture)

ARI500=1.p Mixed: 3/4 is a rational
\$is_rat(3/4) tff(mixed_types_problem$_5$, conjecture)

ARI501=1.p Mixed: 11 is a rational
\$is_rat(11) tff(mixed_types_problem$_6$, conjecture)

ARI502=1.p Mixed: 0.08 is a rational
\$is_rat($0._{08}$) tff(mixed_types_problem$_7$, conjecture)

ARI503=1.p Mixed: 11.33 coerced to integer is an integer
\$is_int(\$to_int($11._{33}$)) tff(mixed_types_problem$_8$, conjecture)

ARI504=1.p Mixed: 2.05 coerced to rational is a rational
\$is_rat(\$to_rat($2._{05}$)) tff(mixed_types_problem$_9$, conjecture)

ARI505=1.p Mixed: 17.99 coerced to integer is not 18
\$to_int($17._{99}) \neq 18$ tff(mixed_types_problem$_{10}$, conjecture)

ARI506=1.p Mixed: 11/2 is 5.5 coerced to rational
11/2 = \$to_rat($5._5$) tff(mixed_types_problem$_{11}$, conjecture)

ARI507=1.p Mixed: 39/4 coerced to real is 9.75
\$to_real(39/4) = $9._{75}$ tff(mixed_types_problem$_{12}$, conjecture)

ARI508=1.p Mixed: 2 is less than 3.5 coerced to integer
\$less(2, \$to_int($3._5$)) tff(mixed_types_problem$_{13}$, conjecture)

ARI509=1.p Mixed: 7/5 is not less that 1.2 coerced to rational
$\neg$ \$less(7/5, \$to_rat($1._2$)) tff(mixed_types_problem$_{14}$, conjecture)

ARI510=1.p Mixed: sum 1/2 and 1/4 is less than 1 coerced to rational
\$less(\$sum(1/2, 1/4), \$to_rat(1)) tff(mixed_types_problem$_{15}$, conjecture)

ARI511=1.p Mixed: 5/19 coerced to rational is less than something
$\exists y$: \$rat: \$less(\$to_rat(5/19), y) tff(mixed_types_problem$_{16}$, conjecture)

ARI512=1.p Mixed: -2 is lesseq to 2.0 coerced to integer
\$lesseq(-2, \$to_int($2._0$)) tff(mixed_types_problem$_{17}$, conjecture)

ARI513=1.p Mixed: 0.5 is lesseq to 1/2 coerced to real
$\$\text{lesseq}(0._5, \$\text{to\_real}(1/2))$ tff(mixed_types_problem$_{18}$, conjecture)

ARI514=1.p Mixed: -2.4 is lesseq to 2 coerced to real
$\$\text{lesseq}(-2._4, \$\text{to\_real}(2))$ tff(mixed_types_problem$_{19}$, conjecture)

ARI515=1.p Mixed: Something is lesseq to 2 coerced to integer
$\exists x$: \$int: $\$\text{lesseq}(x, \$\text{to\_int}(2))$ tff(mixed_types_problem$_{20}$, conjecture)

ARI516=1.p Mixed: 4 coerced to real is greater than 3.2
$\$\text{greater}(\$\text{to\_real}(4), 3._2)$ tff(mixed_types_problem$_{21}$, conjecture)

ARI517=1.p Mixed: 6/12 coerced to rational is not greater than 3/4
$\neg\,\$\text{greater}(\$\text{to\_rat}(6/12), 3/4)$ tff(mixed_types_problem$_{22}$, conjecture)

ARI518=1.p Mixed: Sum of 13.1 coerced to integer and 1 is greatereq to 14
$\$\text{greatereq}(\$\text{sum}(\$\text{to\_int}(13._1), 1), 14)$ tff(mixed_types_problem$_{23}$, conjecture)

ARI519=1.p Mixed: Something is greatereq to 9 coerced to real
$\exists x$: \$real: $\$\text{greatereq}(x, \$\text{to\_real}(9))$ tff(mixed_types_problem$_{24}$, conjecture)

ARI520=1.p Mixed: Sum 2 and 3 is integer
$\$\text{is\_int}(\$\text{sum}(2, 3))$ tff(mixed_types_problem$_{25}$, conjecture)

ARI522=1.p Mixed: Sum 3.5 and 3/4 coerced to real is 4.25
$\$\text{sum}(3._5, \$\text{to\_real}(3/4)) = 4._{25}$ tff(mixed_types_problem$_{27}$, conjecture)

ARI523=1.p Mixed: Difference -1/8 and 3/16 is rational
$\$\text{is\_rat}(\$\text{difference}(-1/8, 3/16))$ tff(mixed_types_problem$_{28}$, conjecture)

ARI524=1.p Mixed: Product 5/12 and 7/10 is rational
$\$\text{is\_rat}(\$\text{product}(5/12, 7/10))$ tff(mixed_types_problem$_{29}$, conjecture)

ARI525=1.p Mixed: ((- 7/15) + 4/15) coerced to integer is greatereq to 0
$\$\text{greatereq}(\$\text{to\_int}(\$\text{sum}(\$\text{uminus}(7/15), 4/15)), 0)$ tff(mixed_types_problem$_{30}$, conjecture)

ARI526=1.p Mixed: (4.05 + 3.6) - 53/20 = 5
$\$\text{to\_int}(\$\text{difference}(\$\text{to\_rat}(\$\text{sum}(4._{05}, 3._6)), 53/20)) = 5$ tff(mixed_types_problem$_{31}$, conjecture)

ARI528=1.p Mixed: Mad mixture 1
$\$\text{sum}(\$\text{to\_int}(50._{98}), \$\text{product}(2, \$\text{product}(\$\text{to\_int}(11/2), 5))) = 100$ tff(mixed_types_problem$_{33}$, conjecture)

ARI529=1.p Mixed: Mad mixture 2
$\$\text{less}(\$\text{to\_int}(\$\text{difference}(10._0, 0._{0001})), \$\text{product}(\$\text{to\_int}(11/2), 2))$ tff(mixed_types_problem$_{34}$, conjecture)

ARI533=1.p Mixed: Product 6.4 and 0.469 is an integer
$\$\text{is\_int}(\$\text{product}(6._4, 0._{469}))$ tff(anti_mixed_types_problem$_{38}$, conjecture)

ARI534=1.p Mixed: Sum 0.5 coerced to integer and 1 is not a rational
$\neg\,\$\text{is\_rat}(\$\text{sum}(\$\text{to\_int}(0._5), 1))$ tff(anti_mixed_types_problem$_{39}$, conjecture)

ARI535=1.p Integer: Stickel's arithmetic challenge
p: (\$int × \$int × \$int) → \$o tff(p_type, type)
$\exists x$: \$int, y: \$int: $(p(2, y, \$\text{sum}(2, y)) \Rightarrow p(x, 2, \$\text{product}(x, 2)))$ tff(a, conjecture)

ARI536=1.p Real: Square root of two exists
$\exists x$: \$real: $\$\text{product}(x, x) = 2._0$ tff(the, conjecture)

ARI536=2.p Real: Square root of two exists and is not rational
$\forall x$: \$real: $(\$\text{product}(x, x) = 2._0 \Rightarrow \neg\,\$\text{is\_rat}(x))$ tff(the, conjecture)

ARI536=3.p Real: Square root of two exists and is rational
$\exists x$: \$real: ($\$\text{product}(x, x) = 2._0$ and $\$\text{is\_rat}(x)$) tff(the, conjecture)

ARI536=4.p Rational: Square root of two does not exist
$\exists x$: \$rat: $\$\text{product}(x, x) = 2/1$ tff(the, conjecture)

ARI537=1.p Integer: 12 less than sum 5 and 8
$\$\text{less}(12, \$\text{sum}(5, 8))$ tff(int_combined_problem$_1$, conjecture)

ARI538=1.p Integer: -15 less than difference 0 and -15
$\$\text{less}(-15, \$\text{difference}(0, -15))$ tff(int_combined_problem$_2$, conjecture)

ARI539=1.p Integer: Sum 9 and 3 greater than -21

$\$greater(\$sum(9, 3), -21)$ tff(int_combined_problem$_3$, conjecture)

ARI540=1.p Integer: Product 5 an 7 lesseq to 36
$\$lesseq(\$product(5, 7), 36)$ tff(int_combined_problem$_4$, conjecture)

ARI541=1.p Integer: Minus product -18 and -4 greatereq -75
$\$greatereq(\$uminus(\$product(-18, -4)), -75)$ tff(int_combined_problem$_5$, conjecture)

ARI542=1.p Integer: Sum of product -5 and -5, and -25 is 0
$\$sum(\$product(-5, -5), -25) = 0$ tff(int_combined_problem$_6$, conjecture)

ARI543=1.p Integer: -3 * (14 - 69) less than -76 + 271
$\$less(\$product(-3, \$difference(14, 69)), \$sum(\$uminus(76), 271))$ tff(int_combined_problem$_7$, conjecture)

ARI544=1.p Integer: Sum 2 and 3 less than 7
$\forall x$: \$int: $(\$sum(2, 3) = x \Rightarrow \$less(x, 7))$ tff(int_combined_problem$_8$, conjecture)

ARI545=1.p Integer: Something plus iteself less than -13
$\exists x$: \$int: $\$less(\$sum(x, x), -13)$ tff(int_combined_problem$_9$, conjecture)

ARI546=1.p Integer: Difference -4 and sum 0 and -3 is something
$\exists x$: \$int: $\$difference(-4, \$sum(0, -3)) = x$ tff(int_combined_problem$_{10}$, conjecture)

ARI547=1.p Integer: Product something and 3 is 27 means 8 less than that
$\exists x$: \$int: $(\$product(x, 3) = 27$ and $\$less(8, x))$ tff(int_combined_problem$_{11}$, conjecture)

ARI548=1.p Integer: Difference -25 and product something and 0 lesseq to 0
$\exists x$: \$int: $\$lesseq(\$difference(-25, \$product(x, -5)), 0)$ tff(int_combined_problem$_{12}$, conjecture)

ARI549=1.p Integer: Product of sum -2 and -3, and 0 is 0
$\$product(\$sum(-2, -3), 0) = 0$ tff(int_combined_problem$_{13}$, conjecture)

ARI550=1.p Integer: Sum of product something and 32, and -7 less than -128
$\exists x$: \$int: $\$less(\$sum(\$product(x, 32), -7), -128)$ tff(int_combined_problem$_{14}$, conjecture)

ARI551=1.p Rational: 7/8 less than sum 5/8 and 5/16
$\$less(7/8, \$sum(5/8, 5/16))$ tff(rat_combined_problem$_{11}$, conjecture)

ARI552=1.p Rational: -35/4 less than difference 0/1 and -53/12
$\$less(-35/4, \$difference(0/1, -53/12))$ tff(rat_combined_problem$_{12}$, conjecture)

ARI553=1.p Rational: Sum 9/17 and 3/5 greater than -8/145
$\$greater(\$sum(9/17, 3/5), -8/145)$ tff(rat_combined_problem$_{13}$, conjecture)

ARI554=1.p Rational: Product 3/8 and 7/10 lesseq to 23/80
$\$lesseq(\$product(3/8, 7/10), 23/80)$ tff(rat_combined_problem$_{14}$, conjecture)

ARI555=1.p Rational: Minus product -18/25 and -1/4 greatereq to -9/50
$\$greatereq(\$uminus(\$product(-18/25, -1/4)), -9/50)$ tff(rat_combined_problem$_{15}$, conjecture)

ARI556=1.p Rational: Sum of product -3/40 and -12/1, and -9/10 is 0/1
$\$sum(\$product(-3/40, -12/1), -9/10) = 0/1$ tff(rat_combined_problem$_{16}$, conjecture)

ARI557=1.p Rational: Product something and 9/12 is 3/7 means 1/2 less than it
$\exists x$: \$rat: $\$product(x, 9/12) = 3/(7$ and $\$less(1/2, x))$ tff(rat_combined_problem$_{17}$, conjecture)

ARI558=1.p Rational: -1/4 - (something * -1/20) lesseq to 0/1
$\exists x$: \$rat: $\$lesseq(\$difference(-1/4, \$product(x, -1/20)), 0/1)$ tff(rat_combined_problem$_{18}$, conjecture)

ARI559=1.p Rational: Product of sum -1/2 and -1/3, and 0/1 is 0/1
$\$product(\$sum(-1/2, -1/3), 0/1) = 0/1$ tff(rat_combined_problem$_{19}$, conjecture)

ARI560=1.p Real: 0.875 less than sum 0.625 and 0.3125
$\$less(0._{875}, \$sum(0._{625}, 0._{3125}))$ tff(real_combined_problem$_{11}$, conjecture)

ARI561=1.p Real: -8.75 less than difference 0.0 and -4.42
$\$less(-8._{75}, \$difference(0._0, -4._{42}))$ tff(real_combined_problem$_{12}$, conjecture)

ARI562=1.p Real: Sum 0.52 and 0.6 greater than -0.055
$\$greater(\$sum(0._{52}, 0._6), -0._{055})$ tff(real_combined_problem$_{13}$, conjecture)

ARI563=1.p Real: Product 14.375 and 7.5 lesseq to 123.8
$\$lesseq(\$product(14._{375}, 7._5), 123._8)$ tff(real_combined_problem$_{14}$, conjecture)

ARI564=1.p Real: -(-6.48 * -2.25) greatereq to -15.62

$greatereq($uminus($product($-6._{48}, -2._{25}$)), $-15._{62}$)   tff(real_combined_problem$_{15}$, conjecture)

ARI565=1.p Real: (-0.075 * -12.0) + -0.9) is 0.0
$sum($product($-0._{075}, -12._0$), $-0._9$) = $0._0$ tff(real_combined_problem$_{16}$, conjecture)

ARI566=1.p Real: Product something and 0.75 is 0.42 means 0.5 less than it
$\exists x$: $real: ($product($x, 0._{75}$) = $0._{42}$ and $less($0._5, x$))   tff(real_combined_problem$_{17}$, conjecture)

ARI567=1.p Real: (-0.25 - (something * -0.05) lesseq to 0.0
$\exists x$: $real: $lesseq($difference($-0._{25}$, $product($x, -0._{05}$)), $0._0$)   tff(real_combined_problem$_{18}$, conjecture)

ARI568=1.p Real: Product of sum -2.8 and -3.6, and 0.0 is 0.0
$product($sum($-2._8, -3._6$), $0._0$) = $0._0$ tff(real_combined_problem$_{19}$, conjecture)

ARI570=1.p Weakening an inequation
$\forall x$: $int, y: $int: ($less(y, x) $\Rightarrow$ $less($y$, $sum($x$, 3)))   tff(weakening_ineq, conjecture)

ARI571=1.p Negating and weakening an inequation
$\forall x$: $int, y: $int: ($less(y, x) $\Rightarrow$ $less($difference(2, x), $difference(5, y)))   tff(neg_weakening_ineq, conjecture)

ARI572=1.p Simple implication between inequations
$\forall x$: $int, y: $int: ($less($sum($y$, $uminus($x$)), $sum($x$, $uminus($y$))) $\Rightarrow$ $less($y, x$))   tff(impl_ineq, conjecture)

ARI573=1.p Three inequations imply a fourth one
$\forall x$: $int, y: $int, z: $int: (($lesseq(1, $sum($product(x, 2), $uminus($y$))) and $lesseq(1, $sum($product(y, 2), $uminus($z$))) and
$lesseq(2, $sum($sum(x, y), z)))   tff(impl_3_ineq, conjecture)

ARI574=1.p Inequation system has exactly one solution
$\forall x$: $int, y: $int: (($lesseq(7, $sum($x, y$)) and $lesseq($sum(x, 5), $product(2, y)) and $lesseq($y$, 4)) $\iff$ ($x = 3$ and $y =$
4))   tff(ineq_sys_has_1_sol, conjecture)

ARI575=1.p Inequation system has exactly one integer solution
$\forall x$: $int, y: $int, z: $int: (($less(3, x) and $less($x, y$) and $less($y, z$) and $less($sum($sum($x$, $product(2, y)), $product(3, z)), 3
($x = 4$ and $y = 5$ and $z = 6$))   tff(ineq_sys_has_1_int_sol, conjecture)

ARI575=2.p Inequation system has more than one rational solution
$\forall x$: $rat, y: $rat, z: $rat: (($less(3/1, x) and $less($x, y$) and $less($y, z$) and $less($sum($sum($x$, $product(2/1, y)), $product(3/
$x = 4/(1$ and ($y = 5/(1$ and ($z = 6/1$)))))   tff(ineq_sys_has_1_int_sol, conjecture)

ARI575=3.p Inequation system has more than one real solution
$\forall x$: $real, y: $real, z: $real: (($less($3._0, x$) and $less($x, y$) and $less($y, z$) and $less($sum($sum($x$, $product($2._0, y$)), $product(3
($x = 4._0$ and $y = 5._0$ and $z = 6._0$))   tff(ineq_sys_has_1_int_sol, conjecture)

ARI576=1.p Inequation system is solvable (e.g., X = 10)
$\exists x$: $int: ($lesseq($product(2, x), 21) and $lesseq(29, $product(3, x)))   tff(ineq_sys_solvable$_1$, conjecture)

ARI577=1.p Inequation system is solvable (e.g., X = 5, Y = 4)
$\exists x$: $int, y: $int: ($lesseq(4, y) and $lesseq($sum(y, 1), x) and $lesseq($sum(x, y), 10))   tff(ineq_sys_solvable$_2$, conjecture)

ARI578=1.p Inequation system is solvable (e.g., X = 3, Y = 6)
$\exists x$: $int, y: $int: ($lesseq(2, x) and $lesseq(2, y) and $lesseq($sum(x, y), 9) and $lesseq(12, $sum($product(2, x), y)))   tff(in

ARI579=1.p Inequation system is not solvable over $int (e.g., X = Y = 1/2)
$\exists x$: $int, y: $int: ($less(0, x) and $less(0, y) and $less($sum($product(3, x), $product(4, y)), 6))   tff(ineq_sys_rat_solvable, co

ARI579=2.p Inequation system is solvable over $rat (e.g., X = Y = 1/2)
$\exists x$: $rat, y: $rat: ($less(0/1, x) and $less(0/1, y) and $less($sum($product(3/1, x), $product(4/1, y)), 6/1))   tff(ineq_sys_rat

ARI579=3.p Inequation system is solvable over $real (e.g., X = Y = 1/2)
$\exists x$: $real, y: $real: ($less($0._0, x$) and $less($0._0, y$) and $less($sum($product($3._0, x$), $product($4._0, y$)), $6._0$))   tff(ineq_sys_rat_s

ARI580=1.p Inequation system is solvable (choose, e.g., Y = X + 1)
$\forall x$: $int: $\exists y$: $int: ($less(x, y) and $less($y$, $sum($x$, 3)))   tff(mix_quant_ineq_sys_solvable$_1$, conjecture)

ARI581=1.p Inequation system is solvable (choose, e.g., Y = 8 - X)
$\forall x$: $int: ($less(5, x) $\Rightarrow$ $\exists y$: $int: ($less(y, 3) and $less(7, $sum($x, y$))))   tff(mix_quant_ineq_sys_solvable$_2$, conjecture)

ARI582=1.p Inequation system is solvable (choose, e.g., Z = X + Y)
$\forall x$: $int, y: $int: ($less(x, y) $\Rightarrow$ $\exists z$: $int: ($less($product($x$, 2), z) and $less($z$, $product($y$, 2))))   tff(mix_quant_ineq_sys_sol

ARI583=1.p Inequation system is solvable (choose, e.g., W = 3 - X)
$\forall x$: $int, y: $int, z: $int: (($less(0, x) and $lesseq(0, y) and $lesseq(0, z) and ($less(x, y) or $less($x, z$))) $\Rightarrow$ $\exists w$: $int: ($less($su

ARI584=1.p Interval (Y,Y+3) cannot cover interval (X,X+5)

$\forall x$: \$int, y: \$int: $\exists z$: \$int: (\$less(x, z) and \$less$(z, \$sum(x, 5))$ and $\neg$ \$less(y, z) and \$less$(z, \$sum(y, 3))$)   tff(interv_3_canno

ARI585=1.p Interval (X+5,X+8) is covered by (Y,Y+4), e.g. for Y = X + 5
$\forall x$: \$int: $\exists y$: \$int: $\forall z$: \$int: ((\$less(\$sum$(x, 5), z)$ and \$less$(z, \$sum(x, 8))$) $\Rightarrow$ (\$less(y, z) and \$less$(z, \$sum(y, 4))$))   tff(int

ARI586=1.p For positive X, there is a Y between X and 3X (e.g., Y = 2X)
$\forall x$: \$int: (\$less$(0, x)$ $\Rightarrow$ $\exists y$: \$int: (\$less(x, y) and \$less$(y, \$product(x, 3))$))   tff(exists_Y_between_X_and_3X, conjecture)

ARI587=1.p For X > 1, there is a Y between X+2 and 3X (e.g., Y = 2X + 1)
$\forall x$: \$int: (\$less$(1, x)$ $\Rightarrow$ $\exists y$: \$int: (\$less(\$sum$(x, 2), y)$ and \$less$(y, \$product(x, 3))$))   tff(exists_Y_between_Xplus2_and_3X,

ARI588=1.p If X = 2 then Y < X-1 xor 3-X $\leq$ Y
$\exists x$: \$int: $\forall y$: \$int: $\neg$ \$less$(y, \$sum(x, -1))$ $\iff$ \$lesseq(\$sum(3, \$uminus$(x)), y)$ tff(exists_X_complementary_halflines, con

ARI589=1.p There is a number different from Y and Z
$\forall y$: \$int, z: \$int: $\exists x$: \$int: $(y \neq x$ and $z \neq x)$ tff(exists_X_noteq_Y_Z, conjecture)

ARI590=1.p There is a positive number different from Y
$\forall y$: \$int: $\exists x$: \$int: (\$less$(0, x)$ and $y \neq x$)   tff(exists_pos_X_noteq_Y, conjecture)

ARI591=1.p There is an X in the interval (0,3) that is different from Y
$\forall y$: \$int: $\exists x$: \$int: (\$less$(0, x)$ and \$less$(x, 3)$ and $y \neq x$)   tff(exists_X_0_3_noteq_Y, conjecture)

ARI592=1.p If Z > 2, there is an X in the interval (0,Z) different from Y
$\forall y$: \$int, z: \$int: (\$less$(2, z)$ $\Rightarrow$ $\exists x$: \$int: (\$less$(0, x)$ and \$less(x, z) and $y \neq x$))   tff(exists_X_0_Z_noteq_Y, conjecture)

ARI593=1.p There is a number in 5,6,7 that is divisible by 3
p: \$int $\rightarrow$ \$o   tff(p_type, type)
($p(5)$ and $p(6)$ and $p(7)$) $\Rightarrow$ $\exists x$: \$int: p(\$product$(3, x)$)   tff(exists_X_in_5_6_7_div$_3$, conjecture)

ARI594=1.p There is a number in [5,...,7] that is divisible by 3
p: \$int $\rightarrow$ \$o   tff(p_type, type)
$\forall z$: \$int: ((\$lesseq$(5, z)$ and \$lesseq$(z, 7)$) $\Rightarrow$ $p(z)$) $\Rightarrow$ $\exists x$: \$int: p(\$product$(3, x)$)   tff(exists_X_in_5_to_7_div$_3$, conjecture)

ARI595=1.p There is a number in [a,...,a+2] that is divisible by 3
p: \$int $\rightarrow$ \$o   tff(p_type, type)
a: \$int   tff(a_type, type)
$\forall z$: \$int: ((\$lesseq(a, z) and \$lesseq$(z, \$sum(a, 2))$) $\Rightarrow$ $p(z)$) $\Rightarrow$ $\exists x$: \$int: p(\$product$(3, x)$)   tff(exists_X_in_a_to_aplus2_div

ARI596=1.p There is a number in a,a+1,a-1 that is divisible by 3
p: \$int $\rightarrow$ \$o   tff(p_type, type)
a: \$int   tff(a_type, type)
($p(a)$ and p(\$sum$(a, 1)$) and p(\$difference$(a, 1)$)) $\Rightarrow$ $\exists x$: \$int: p(\$product$(3, x)$)   tff(exists_X_in_a_aplus1_aminus1_div$_3$, co

ARI597=1.p Either a or b or their sum is even
p: \$int $\rightarrow$ \$o   tff(p_type, type)
a: \$int   tff(a_type, type)
b: \$int   tff(b_type, type)
($p(a)$ and $p(b)$ and p(\$sum(a, b))) $\Rightarrow$ $\exists x$: \$int: p(\$product$(2, x)$)   tff(a_or_b_or_aplusb_even, conjecture)

ARI598=1.p Either a or 3a+1 is even
p: \$int $\rightarrow$ \$o   tff(p_type, type)
a: \$int   tff(a_type, type)
($p(a)$ and p(\$sum(\$product$(3, a), 1)$)) $\Rightarrow$ $\exists x$: \$int: p(\$product$(2, x)$)   tff(a_or_3aplus1_even, conjecture)

ARI599=1.p Inequations imply a = b, hence f(a,b) = f(b,a)
a: \$int   tff(a_type, type)
b: \$int   tff(b_type, type)
f: (\$int $\times$ \$int) $\rightarrow$ \$int   tff(f_type, type)
(\$lesseq(\$product$(2, a)$, \$product$(2, b)$) and \$lesseq(\$product$(3, b)$, \$product$(3, a)$)) $\Rightarrow$ $f(a, b) = f(b, a)$ tff(ineq_imply_f_e

ARI600=1.p Inequations imply a+1 = b-1, hence f(a+1,b-1) $\leq$ f(b-1,a+1) + 1
a: \$int   tff(a_type, type)
b: \$int   tff(b_type, type)
f: (\$int $\times$ \$int) $\rightarrow$ \$int   tff(f_type, type)
(\$lesseq$(a, \$sum(b, 2))$ and \$lesseq$(b, \$difference(a, 2))$) $\Rightarrow$ \$lesseq(f(\$sum$(a, 1)$, \$difference$(b, 1)$), \$sum(1, f(\$difference$(b, 1)$,

ARI601=1.p If f(X) > X, then 3 < a implies 4 < a+1 < f(a+1)
a: \$int   tff(a_type, type)
f: \$int $\rightarrow$ \$int   tff(f_type, type)

$\forall x$: \$int: \$greater$(f(x), x) \Rightarrow$ (\$less$(3, a) \Rightarrow$ \$less$(4, f($\$sum$(a, 1))))$ tff(fX_gt_X_implies_ineq, conjecture)

ARI602=1.p If f(X) > X, then 4 < 5 < f(5)
f: \$int → \$int tff(f_type, type)
$\forall x$: \$int: \$greater$(f(x), x) \Rightarrow \exists y$: \$int: (\$less$(4, y)$ and \$less$(y, f(5)))$ tff(fX_gt_X_implies_exist_ineq, conjecture)

ARI603=1.p If f(X) > X, then Y = Z + (Y-Z) < Z + f(Y-Z)
f: \$int → \$int tff(f_type, type)
$\forall x$: \$int: \$greater$(f(x), x) \Rightarrow \forall y$: \$int, z: \$int: $\exists x$: \$int: \$less$(y,$ \$sum$(z, f(x)))$ tff(fX_gt_X_implies_exist_large_fX, conjectu

ARI604=1.p If f(X) > X, then f(-X) > -X, hence -f(-X) < X < f(X)
f: \$int → \$int tff(f_type, type)
$\forall x$: \$int: \$greater$(f(x), x) \Rightarrow \forall x$: \$int: \$less(\$uminus$(f($\$uminus$(x))), f(x))$ tff(fX_gt_X_implies_negfnegX_lt_fX, conjectu

ARI605=1.p If f(X) > X, then a + b < f(a) + b < f(a) + f(b)
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
f: \$int → \$int tff(f_type, type)
$\forall x$: \$int: \$greater$(f(x), x) \Rightarrow \exists y$: \$int: (\$less(\$sum$(a, b), y)$ and \$less$(y,$ \$sum$(f(a), f(b))))$ tff(fX_gt_X_implies_f_a_b, conj

ARI606=1.p For monotonic f, 2≤5 implies f(2)≤f(5), thus f(f(2)≤f(f(5))
f: \$int → \$int tff(f_type, type)
$\forall x$: \$int, y: \$int: (\$lesseq$(x, y) \Rightarrow$ \$lesseq$(f(x), f(y))) \Rightarrow$ \$lesseq$(f(f(2)), f(f(5)))$ tff(f_mon_implies_ff2_gt_ff$_5$, conjecture

ARI607=1.p For monotonic f, f(2) ≤ f(3) and f(5) ≤ f(7), hence the sum
f: \$int → \$int tff(f_type, type)
$\forall x$: \$int, y: \$int: (\$lesseq$(x, y) \Rightarrow$ \$lesseq$(f(x), f(y))) \Rightarrow$ \$lesseq(\$sum$(f(2), f(5)),$ \$sum$(f(7), f(3)))$ tff(f_mon_implies_f2

ARI608=1.p Combining monotonicity and transitivity
f: \$int → \$int tff(f_type, type)
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
c: \$int tff(c_type, type)
($\forall x$: \$int, y: \$int: (\$lesseq$(x, y) \Rightarrow$ \$lesseq$(f(x), f(y)))$ and \$lesseq(a, b) and \$less$(b, c)) \Rightarrow$ \$lesseq$(f(a), f(c))$ tff(f_mon_i

ARI609=1.p For mon. f, 0≤a-b => b≤a => f(b)≤f(a) => 0≤f(a)-f(b)
f: \$int → \$int tff(f_type, type)
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
($\forall x$: \$int, y: \$int: (\$lesseq$(x, y) \Rightarrow$ \$lesseq$(f(x), f(y)))$ and \$lesseq(0, \$sum$(a,$ \$uminus$(b)))) \Rightarrow$ \$lesseq(0, \$sum$(f(a),$ \$uminu

ARI610=1.p For mon. f, f(b)<f(a) => b<a => b≤a => 0≤a-b => f(0)≤f(a-b)
f: \$int → \$int tff(f_type, type)
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
($\forall x$: \$int, y: \$int: (\$lesseq$(x, y) \Rightarrow$ \$lesseq$(f(x), f(y)))$ and \$less$(f(b), f(a))) \Rightarrow$ \$lesseq$(f(0), f($\$sum$(a,$ \$uminus$(b))))$ tf

ARI611=1.p Intervals (5,15) and (8,18) intersect
p: \$int → \$o tff(p_type, type)
q: \$int → \$o tff(q_type, type)
($\forall x$: \$int: ((\$less$(5, x)$ and \$less$(x, 15)) \iff p(x))$ and $\forall x$: \$int: ((\$less$(8, x)$ and \$less$(x, 18)) \iff q(x))) \Rightarrow$
$\exists x$: \$int: $(p(x)$ and $q(x))$ tff(interv_5_15_and_8_18_intersect, conjecture)

ARI612=1.p Interval (8,12) is contained in (5,15)
p: \$int → \$o tff(p_type, type)
q: \$int → \$o tff(q_type, type)
($\forall x$: \$int: ((\$less$(5, x)$ and \$less$(x, 15)) \iff p(x))$ and $\forall x$: \$int: ((\$less$(8, x)$ and \$less$(x, 12)) \iff q(x))) \Rightarrow$
$\forall x$: \$int: $(q(x) \Rightarrow p(x))$ tff(interv_8_12_subset_5$_{15}$, conjecture)

ARI613=1.p There is an X > 3 and a Y < 1 whose sum is 0
p: \$int → \$o tff(p_type, type)
q: \$int → \$o tff(q_type, type)
($\forall x$: \$int: (\$less$(3, x) \Rightarrow p(x))$ and $\forall x$: \$int: (\$less$(x, 1) \Rightarrow q(x))) \Rightarrow \exists x$: \$int, y: \$int: $(p(x)$ and $q(y)$ and \$sum$(x, y) =$
$0)$ tff(interv_3_infty_and_neginfty_1_contain_compl, conjecture)

ARI614=1.p There is an X>a and a Y<1 whose sum is 0 (X = max(a+1,0), Y = -X)
p: \$int → \$o tff(p_type, type)

q: \$int $\rightarrow$ \$o tff(q_type, type)
a: \$int tff(a_type, type)
$(\forall x$: \$int: (\$less$(a, x) \Rightarrow p(x))$ and $\forall x$: \$int: (\$less$(x, 0) \Rightarrow q(x))) \Rightarrow \exists x$: \$int, y: \$int: $(p(x)$ and $q(y)$ and \$sum$(x, y) =$ $0)$ tff(interv_a_infty_and_neginfty_1_contain_compl, conjecture)

ARI615=1.p If Z≤W, then [X-Z,X+Z] is a subset of [X-W,X+W]
p: (\$int × \$int × \$int) $\rightarrow$ \$o tff(p_type, type)
$\forall x$: \$int, y: \$int, z: \$int: ((\$lesseq(\$sum(y, \$uminus(z)), x) and \$lesseq(x, \$sum(y, z))) $\iff p(x, y, z)) \Rightarrow \forall x$: \$int, y: \$int, z: \$
$(p(x, y, z) \Rightarrow p(x, y, w)))$ tff(interv_with_smaller_radius_contained, conjecture)

ARI616=1.p If intervals intersect, then sum_of_radii >= distance_of_centers
p: (\$int × \$int × \$int) $\rightarrow$ \$o tff(p_type, type)
$\forall x$: \$int, y: \$int, z: \$int: ((\$lesseq(\$sum(y, \$uminus(z)), x) and \$lesseq(x, \$sum(y, z))) $\iff p(x, y, z)) \Rightarrow \forall y_1$: \$int, z_1: \$int, y
\$lesseq(\$sum(y_1, \$uminus(y_2)), \$sum(z_1, z_2))) tff(sum_of_radii_gt_distance_of_centers, conjecture)

ARI617=1.p Two different definitions of absolute value agree
f: \$int $\rightarrow$ \$int tff(f_type, type)
g: \$int $\rightarrow$ \$int tff(g_type, type)
$(\forall x$: \$int: (\$lesseq($x, f(x)$) and \$lesseq(\$uminus(x), $f(x)$) and (\$lesseq($f(x), x$) or \$lesseq($f(x)$, \$uminus(x)))) and $\forall x$: \$int: (
x or $g(x) =$ \$uminus(x)))) $\Rightarrow \forall x$: \$int: $f(x) = g(x)$ tff(absolute_value_defs, conjecture)

ARI618=1.p Absolute value (unusually defined) is idempotent
f: \$int $\rightarrow$ \$int tff(f_type, type)
$\forall x$: \$int: (\$lesseq($x, f(x)$) and \$lesseq(\$uminus(x), $f(x)$) and (\$lesseq($f(x), x$) or \$lesseq($f(x)$, \$uminus(x)))) $\Rightarrow \forall x$: \$int: $f($
$f(x)$ tff(absolute_value_idempotent, conjecture)

ARI619=1.p 5 is not a power of 2
pow_2: \$int $\rightarrow$ \$o tff(pow2_type, type)
$\forall x$: \$int: $(\text{pow}_2(x) \iff (x = 1$ or (\$lesseq($2, x$) and $\exists y$: \$int: (\$product($2, y$) $= x$ and $\text{pow}_2(y)$))))) $\Rightarrow \neg \text{pow}_2(5)$ tff(not_

ARI619=2.p 5 is not a power of 2
pow_2: \$rat $\rightarrow$ \$o tff(pow2_type, type)
$\forall x$: \$rat: $(\text{pow}_2(x) \iff x = 1/(1$ or (\$lesseq($2/1, x$) and $\exists y$: \$rat: (\$product($2/1, y$) $= x$ and $\text{pow}_2(y)$))))) $\Rightarrow$
$\neg \text{pow}_2(5/1)$ tff(not_pow_of_2_5, conjecture)

ARI619=3.p 5 is not a power of 2
pow_2: \$real $\rightarrow$ \$o tff(pow2_type, type)
$\forall x$: \$real: $(\text{pow}_2(x) \iff (x = 1._0$ or (\$lesseq($2._0, x$) and $\exists y$: \$real: (\$product($2._0, y$) $= x$ and $\text{pow}_2(y)$))))) $\Rightarrow$
$\neg \text{pow}_2(5._0)$ tff(not_pow_of_2_5, conjecture)

ARI620=1.p 8 is a power of 2
pow_2: \$int $\rightarrow$ \$o tff(pow2_type, type)
$\forall x$: \$int: $(\text{pow}_2(x) \iff (x = 1$ or (\$lesseq($2, x$) and $\exists y$: \$int: (\$product($2, y$) $= x$ and $\text{pow}_2(y)$))))) $\Rightarrow \text{pow}_2(8)$ tff(pow_o

ARI621=1.p 12 is not a power of 2
pow_2: \$int $\rightarrow$ \$o tff(pow2_type, type)
$\forall x$: \$int: $(\text{pow}_2(x) \iff (x = 1$ or (\$lesseq($2, x$) and $\exists y$: \$int: (\$product($2, y$) $= x$ and $\text{pow}_2(y)$))))) $\Rightarrow \neg \text{pow}_2(12)$ tff(not

ARI621=2.p 12 is not a power of 2
pow_2: \$rat $\rightarrow$ \$o tff(pow2_type, type)
$\forall x$: \$rat: $(\text{pow}_2(x) \iff x = 1/(1$ or (\$lesseq($2/1, x$) and $\exists y$: \$rat: (\$product($2/1, y$) $= x$ and $\text{pow}_2(y)$))))) $\Rightarrow$
$\neg \text{pow}_2(12/1)$ tff(not_pow_of_2_{10}, conjecture)

ARI621=3.p 12 is not a power of 2
pow_2: \$real $\rightarrow$ \$o tff(pow2_type, type)
$\forall x$: \$real: $(\text{pow}_2(x) \iff (x = 1._0$ or (\$lesseq($2._0, x$) and $\exists y$: \$real: (\$product($2._0, y$) $= x$ and $\text{pow}_2(y)$))))) $\Rightarrow$
$\neg \text{pow}_2(12._0)$ tff(not_pow_of_2_{10}, conjecture)

ARI622=1.p There exist two powers of 2 whose sum equals 10
pow_2: \$int $\rightarrow$ \$o tff(pow2_type, type)
$\forall x$: \$int: $(\text{pow}_2(x) \iff (x = 1$ or (\$lesseq($2, x$) and $\exists y$: \$int: (\$product($2, y$) $= x$ and $\text{pow}_2(y)$))))) $\Rightarrow \exists x$: \$int, y: \$int: (pow
$10)$ tff(sum_of_pows_of_2_eq_{10}, conjecture)

ARI623=1.p There is no strictly mon fct from \$rat or \$real to a non-dense set
f: \$rat $\rightarrow$ \$rat tff(f_type, type)
$\neg \forall x$: \$rat, y: \$rat: (\$greater(x, y) $\Rightarrow$ \$greater($f(x)$, \$sum($f(y), 1/1$))) tff(not_ex_mon_mapping_rat_to_nondense, conjectu

ARI624=1.p f(X) cannot always be smaller than avg(f(X-Y),f(X+Y)) - 1

f: \$rat → \$rat tff(f_type, type)
¬ ∀x: \$rat, y: \$rat: (\$greater(y, 0/1) ⇒ \$less($f(x)$, \$sum(\$sum(\$product(1/2, f(\$sum(x, \$uminus(y)))), \$product(1/2, f(\$sum

ARI625=1.p There is no enumeration of the reals
f: \$real → \$real tff(f_type, type)
¬ ∀x: \$real, y: \$real: ($x = y$ or \$less($f(x)$, $f(y)$) or \$greatereq($f(x)$, \$sum($f(y)$, $1._0$))) tff(not_ex_enum_of_reals, conjecture)

ARI625=2.p There is no enumeration of the reals
f: \$rat → \$rat tff(f_type, type)
¬ ∀x: \$rat, y: \$rat: ($x = y$ or \$less($f(x)$, $f(y)$) or \$greatereq($f(x)$, \$sum($f(y)$, 1/1))) tff(not_ex_enum_of_rats, conjecture)

ARI626=1.p Overflow checking on the integers
A simple test that should go over 2∧64 (more than machine integers) and therefore detect whether the prover uses arbitrary precision arithmetic.
∃x: \$int: (x = \$sum(18446744073709551616, 18446744073709551616) and \$greater(x, 0)) tff(the, conjecture)

ARI627=1.p Overflow checking on the rationals
A simple test computing (2∧64-1)/2∧64 + (2∧64-1)/2∧64, for which the denominator should get too big for machine int, therefore detecting whether the prover uses arbitrary precision arithmetic.
∃x: \$rat: (x = \$sum(18446744073709551615/18446744073709551616, 18446744073709551615/18446744073709551616) and (x
2/1)) tff(the, conjecture)

ARI628=1.p Example 0
y: \$real tff(y_type, type)
x: \$real tff(x_type, type)
v: \$real tff(v_type, type)
u: \$real tff(u_type, type)
\$greater(u, $0._0$) tff(hypothesis$_{00}$, hypothesis)
\$less(u, v) tff(hypothesis$_{01}$, hypothesis)
\$less(v, $1._0$) tff(hypothesis$_{02}$, hypothesis)
\$greatereq(x, $2._0$) tff(hypothesis$_{03}$, hypothesis)
\$lesseq(x, y) tff(hypothesis$_{04}$, hypothesis)
\$less(\$product(\$product($2._0$, \$product(u, u)), x), \$product(\$product(y, y), v)) tff(conclusion, conjecture)

ARI629=1.p Example 1
x: \$real tff(x_type, type)
y: \$real tff(y_type, type)
\$greater(x, $1._0$) tff(hypothesis, hypothesis)
\$greatereq(\$product(\$sum($1._0$, \$product(y, y)), x), \$sum($1._0$, \$product(y, y))) tff(conclusion, conjecture)

ARI630=1.p Example 2
x: \$real tff(x_type, type)
\$greater(x, $0._0$) tff(hypothesis$_{00}$, hypothesis)
\$less(x, $1._0$) tff(hypothesis$_{01}$, hypothesis)
\$greater(\$quotient($1._0$, \$sum(\$product($-1._0$, x), $1._0$)), \$quotient($1._0$, \$sum(\$product($-1._0$, \$product(x, x)), $1._0$))) tff(conclu

ARI631=1.p Example 3
u: \$real tff(u_type, type)
v: \$real tff(v_type, type)
w: \$real tff(w_type, type)
z: \$real tff(z_type, type)
\$greater(u, $0._0$) tff(hypothesis, hypothesis)
\$less(u, v) tff(hypothesis$_{01}$, hypothesis)
\$greater(z, $0._0$) tff(hypothesis$_{02}$, hypothesis)
\$less(\$sum($1._0$, z), w) tff(hypothesis$_{03}$, hypothesis)
\$less(\$product(\$product(\$sum(\$sum(u, v), z), \$sum(\$sum(u, v), z)), \$sum(\$sum(u, v), z)), \$product(\$product(\$product(\$prod

ARI632=1.p Example 6
x: \$real tff(x_type, type)
y: \$real tff(y_type, type)
u: \$real tff(u_type, type)
v: \$real tff(v_type, type)
f: \$real → \$real tff(f_type, type)
∀x: \$real, y: \$real: (\$greatereq(x, y) ⇒ \$greatereq($f(x)$, $f(y)$)) tff(f_non_decreasing, axiom)
\$less(u, v) tff(hypothesis, hypothesis)

$\$lesseq(x, y)$ tff(hypothesis$_{01}$, hypothesis)
$\$less(\$sum(u, f(x)), \$sum(v, f(y)))$ tff(conclusion, conjecture)

ARI633=1.p Example 7
u: \$real tff(u_type, type)
v: \$real tff(v_type, type)
w: \$real tff(w_type, type)
x: \$real tff(x_type, type)
f: \$real → \$real tff(f_type, type)
$\forall x$: \$real: $\$lesseq(f(x), 1.{}_0)$ tff(f_less_equal$_1$, axiom)
$\$less(u, v)$ tff(hypothesis, hypothesis)
$\$greater(w, 0.{}_0)$ tff(hypothesis$_{01}$, hypothesis)
$\$less(\$sum(u, \$product(w, f(x))), \$sum(v, w))$ tff(conclusion, conjecture)

ARI634=1.p Example 8
u: \$real tff(u_type, type)
v: \$real tff(v_type, type)
w: \$real tff(w_type, type)
x: \$real tff(x_type, type)
f: \$real → \$real tff(f_type, type)
$\forall x$: \$real: $\$lesseq(f(x), 2.{}_0)$ tff(f_less_equal$_2$, axiom)
$\$less(u, v)$ tff(hypothesis, hypothesis)
$\$greater(w, 0.{}_0)$ tff(hypothesis$_{01}$, hypothesis)
$\$less(\$sum(u, \$product(w, \$sum(-1.{}_0, f(x)))), \$sum(v, w))$ tff(conclusion, conjecture)

ARI635=1.p Example 9
u: \$real tff(u_type, type)
v: \$real tff(v_type, type)
w: \$real tff(w_type, type)
x: \$real tff(x_type, type)
y: \$real tff(y_type, type)
s: \$real tff(s_type, type)
f: \$real → \$real tff(f_type, type)
$\forall x$: \$real, y: \$real: $(\$greatereq(x, y) \Rightarrow \$greatereq(f(x), f(y)))$ tff(f_non_decreasing, axiom)
$\$less(u, v)$ tff(hypothesis, hypothesis)
$\$greater(w, 1.{}_0)$ tff(hypothesis$_{01}$, hypothesis)
$\$greater(s, 2.{}_0)$ tff(hypothesis$_{02}$, hypothesis)
$\$less(\$product(\$quotient(1.{}_0, 3.{}_0), \$sum(w, s)), v)$ tff(hypothesis$_{03}$, hypothesis)
$\$lesseq(x, y)$ tff(hypothesis$_{04}$, hypothesis)
$\$less(\$sum(f(x), u), \$sum(\$product(v, v), f(y)))$ tff(conclusion, conjecture)

ARI636=1.p Example 10
u: \$real tff(u_type, type)
v: \$real tff(v_type, type)
x: \$real tff(x_type, type)
y: \$real tff(y_type, type)
f: \$real → \$real tff(f_type, type)
$\forall x$: \$real, y: \$real: $(\$greatereq(x, y) \Rightarrow \$greatereq(f(x), f(y)))$ tff(f_non_decreasing, axiom)
$\$less(u, v)$ tff(hypothesis, hypothesis)
$\$greater(v, 1.{}_0)$ tff(hypothesis$_{01}$, hypothesis)
$\$lesseq(x, y)$ tff(hypothesis$_{02}$, hypothesis)
$\$less(\$sum(f(x), u), \$sum(\$product(v, v), f(y)))$ tff(conclusion, conjecture)

ARI637=1.p Example 13
a: \$real tff(a_type, type)
b: \$real tff(b_type, type)
f: \$real → \$real tff(f_type, type)
$\forall x$: \$real, y: \$real: $f(\$sum(x, y)) = \$product(f(x), f(y))$ tff(f_feature, axiom)
$\$greater(f(a), 2.{}_0)$ tff(hypothesis, hypothesis)
$\$greater(f(b), 2.{}_0)$ tff(hypothesis$_{01}$, hypothesis)
$\$greater(f(\$sum(a, b)), 4.{}_0)$ tff(conclusion, conjecture)

ARI638=1.p Example 14

a: $real   tff(a_type, type)
b: $real   tff(b_type, type)
c: $real   tff(c_type, type)
d: $real   tff(d_type, type)
f: $real → $real   tff(f_type, type)
∀x: $real, y: $real: f($sum(x, y)) = $product(f(x), f(y))   tff(f_feature, axiom)
$greater(f($sum(a, b)), 2._0)   tff(hypothesis, hypothesis)
$greater(f($sum(c, d)), 2._0)   tff(hypothesis_01, hypothesis)
$greater(f($sum(a, $sum(b, $sum(c, d)))), 4._0)   tff(conclusion, conjecture)

ARI639=1.p Example 15
eps: $real   tff(eps_type, type)
c: $real   tff(c_type, type)
k: $real   tff(k_type, type)
x: $real   tff(x_type, type)
n: $real   tff(n_type, type)
$greatereq(n, 0._0)   tff(hypothesis, hypothesis)
$less(n, $product($quotient(1._0, 2._0), $product(k, x)))   tff(hypothesis_01, hypothesis)
$greater(c, 0._0)   tff(hypothesis_02, hypothesis)
$greater(eps, 0._0)   tff(hypothesis_03, hypothesis)
$less(eps, 1._0)   tff(hypothesis_04, hypothesis)
$less($product($sum($product($quotient(1._0, 3._0), $product($quotient(1._0, $sum(3._0, c)), eps)), 1._0), n), $product(k, x))   tff

ARI640=1.p Example 18
x: $real   tff(x_type, type)
y: $real   tff(y_type, type)
$greater(x, 0._0)   tff(hypothesis, hypothesis)
$greater(y, 0._0)   tff(hypothesis_01, hypothesis)
$less(y, 1._0)   tff(hypothesis_02, hypothesis)
$greater($product(x, y), $sum(x, y))   tff(hypothesis_03, hypothesis)
$false   tff(conclusion, conjecture)

ARI641=1.p Example 22
m: $real   tff(m_type, type)
x: $real   tff(x_type, type)
a: $real   tff(a_type, type)
b: $real   tff(b_type, type)
$less(a, b)   tff(hypothesis, hypothesis)
$greater(x, a)   tff(hypothesis_01, hypothesis)
$greatereq(m, $ceiling($product($quotient(1._0, $sum($product(−1._0, a), x)), $sum($product(−1._0, a), b))))   tff(hypothesis_0
$less($sum(a, $product($quotient(1._0, $sum(1._0, m)), $sum($product(−1._0, a), b))), x)   tff(conclusion, conjecture)

ARI642=1.p Example 23
m: $real   tff(m_type, type)
x: $real   tff(x_type, type)
a: $real   tff(a_type, type)
b: $real   tff(b_type, type)
f: $real → $real   tff(f_type, type)
∀m: $real: ($greater(m, 0._0) ⇒ $less(f($ceiling(m)), $sum(a, $product($quotient(1._0, $ceiling(m)), $sum($product(−1._0, a), b
$less(a, b)   tff(hypothesis, hypothesis)
$greater(x, a)   tff(hypothesis_01, hypothesis)
$greatereq(m, $product($quotient(1._0, $sum($product(−1._0, a), x)), $sum($product(−1._0, a), b)))   tff(hypothesis_02, hypothe
$less(f($ceiling(m)), x)   tff(conclusion, conjecture)

ARI643=1.p Prove that a != 0 implies 0 / a = 0
a: $int   tff(a_type, type)
a ≠ 0 ⇒ $quotient_e(0, a) = 0   tff(conj, conjecture)

ARI644=1.p Prove that a != 0 implies b / a * a ≤ b
a: $int   tff(a_type, type)
b: $int   tff(a_type_001, type)
a ≠ 0 ⇒ $lesseq($quotient_e(b, $product(a, a)), b)   tff(conj, conjecture)

ARI645=1.p Prove that d >= 0, b >= a, a > 0 imply d / b ≤ d / a
a: \$int tff(a_type, type)
b: \$int tff(a_type$_{001}$, type)
d: \$int tff(a_type$_{002}$, type)
(\$greatereq(d, 0) and \$greatereq(b, a) and \$greater(a, 0)) $\Rightarrow$ \$lesseq(\$quotient_e(d, b), \$quotient_e(d, a)) tff(conj, conjectu

ARI646=1.p Simple reasoning about linear inequalities
a: \$int tff(a_type, type)
(\$greater(10, a) and \$lesseq(0, a)) $\iff$ ($a = 9$ or $a = 8$ or $a = 7$ or $a = 6$ or $a = 5$ or $a = 4$ or $a = 3$ or $a = 2$ or $a = 1$ or $a = 0$) tff(conj, conjecture)

ARI647=1.p 2*a ≤ 1 implies 3*a != 3
a: \$int tff(a_type, type)
$\neg$ \$lesseq(-1, \$product(-1, \$product(2, a))) or \$product(3, a) $\neq 3$ tff(conj, conjecture)

ARI648=1.p 2*a > 0 — -4*b + 2*a < 8 implies a >= 1 — a-2*b≤3 — 20*a-30*b=7
b: \$int tff(b_type, type)
a: \$int tff(a_type, type)
\$greater(8, \$difference(\$product(2, a), \$product(4, b))) or \$less(0, \$product(2, a)) tff(conj, axiom)
\$sum(\$product(20, a), \$product(-1, \$product(30, b))) = 7 or \$greatereq(3, \$sum(a, \$product(-1, \$product(2, b)))) or \$lesseq(

ARI649=1.p a*a = 25, b*b*b = -125, a < 0 imply a = b
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
\$less(a, 0) tff(conj, axiom)
\$product(a, a) = 25 tff(conj$_{001}$, axiom)
\$product(\$product(b, b), b) = -125 tff(conj$_{002}$, axiom)
$a = b$ tff(conj$_{003}$, conjecture)

ARI650=1.p a*a >= 50 & a*a ≤ 60 are inconsistent
a: \$int tff(a_type, type)
\$greatereq(60, \$product(a, a)) tff(conj, axiom)
\$lesseq(50, \$product(a, a)) tff(conj$_{001}$, axiom)

ARI651=1.p Solve simple system of linear inequalities
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
\$lesseq(20, \$product(-1, \$sum(a, \$product(-1, \$product(2, b))))) tff(conj, axiom)
\$lesseq(0, a) tff(conj$_{001}$, axiom)
\$lesseq(-5, \$product(-1, \$sum(a, b))) tff(conj$_{002}$, axiom)

ARI652=1.p Prove that a + 4 > 2, -2 ≤ -3 - a imply a*a = 1
a: \$int tff(a_type, type)
\$less(2, \$sum(a, 4)) tff(conj, axiom)
\$lesseq(-2, \$difference(-3, a)) tff(conj$_{001}$, axiom)
\$product(a, a) = 1 tff(conj$_{002}$, conjecture)

ARI653=1.p Prove that 5*a >= 1, 7*a ≤ 6 are unsat
a: \$int tff(a_type, type)
\$greatereq(6, \$product(7, a)) tff(conj, axiom)
\$lesseq(1, \$product(5, a)) tff(conj$_{001}$, axiom)

ARI654=1.p y >= 5*x - 1, y ≤ 5*x, 5*z ≤ y - 1, 5*z >= y - 2 are unsat
x: \$int tff(x_type, type)
y: \$int tff(y_type, type)
z: \$int tff(z_type, type)
\$greatereq(y, \$difference(\$product(5, x), 1)) tff(conj, axiom)
\$lesseq(y, \$product(5, x)) tff(conj$_{001}$, axiom)
\$lesseq(\$product(5, z), \$difference(y, 1)) tff(conj$_{002}$, axiom)
\$greatereq(\$product(5, z), \$difference(y, 2)) tff(conj$_{003}$, axiom)

ARI655=1.p a >= b, c >= d imply (a-b)*(c-d) >= 0
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
c: \$int tff(c_type, type)

d: $int   tff(d_type, type)
$lesseq(b, a)   tff(conj, axiom)
$lesseq(d, c)   tff(conj_001, axiom)
$lesseq(0, $product($difference(a, b), $difference(c, d)))   tff(conj_002, conjecture)

ARI656=1.p a >= 0, b >= c imply a*b >= a*c
b: $int   tff(b_type, type)
c: $int   tff(c_type, type)
a: $int   tff(a_type, type)
$lesseq(c, b)   tff(conj, axiom)
$lesseq(0, a)   tff(conj_001, axiom)
$lesseq($product(a, c), $product(a, b))   tff(conj_002, conjecture)

ARI657=1.p Satisfy a ≤ -3, a*b ≤ 5
a: $int   tff(a_type, type)
b: $int   tff(b_type, type)
$lesseq(a, −3)   tff(conj, axiom)
$greatereq(5, $product(a, b))   tff(conj_001, axiom)

ARI658=1.p Prove that a*a ≤ 3 and a >= -1 & a ≤ 1 are equivalent
a: $int   tff(a_type, type)
$greatereq(3, $product(a, a)) ⟺ ($lesseq(a, 1) and $greatereq(a, −1))   tff(conj, conjecture)

ARI659=1.p Prove that a*a*a ≤ 3 and a ≤ 1 are equivalent
a: $int   tff(a_type, type)
$greatereq(3, $product($product(a, a), a)) ⟺ $lesseq(a, 1)   tff(conj, conjecture)

ARI660=1.p Prove that a*a*a >= 11 and a >= 3 are equivalent
a: $int   tff(a_type, type)
$lesseq(11, $product($product(a, a), a)) ⟺ $lesseq(3, a)   tff(conj, conjecture)

ARI661=1.p Prove that a*a*a*a*a >= 40 and a >= 3 are equivalent
a: $int   tff(a_type, type)
$lesseq(40, $product($product($product($product(a, a), a), a), a)) ⟺ $lesseq(3, a)   tff(conj, conjecture)

ARI662=1.p Prove that a*a*a*a*a*a*a*a*a*a*a >= 1000 and a > 1 are equivalent
a: $int   tff(a_type, type)
$lesseq(1000, $product($product($product($product($product($product($product($product($product($product(a, a), a), a), a
$less(1, a)   tff(conj, conjecture)

ARI663=1.p Prove that a*b=15 implies a ≤ 15 & a >= -15 & a != 0
a: $int   tff(a_type, type)
b: $int   tff(b_type, type)
$product(a, b) = 15   tff(conj, axiom)
a ≠ 0 and $greatereq(a, −15) and $lesseq(a, 15)   tff(conj_001, conjecture)

ARI664=1.p 5*a + 11*b = 1 implies a*b ≤ -36 — a*b >= -2
a: $int   tff(a_type, type)
b: $int   tff(b_type, type)
$sum($product(5, a), $product(11, b)) = 1   tff(conj, axiom)
$lesseq(−2, $product(a, b)) or $greatereq(−36, $product(a, b))   tff(conj_001, conjecture)

ARI665=1.p a*b ≤ -36 — a*b >= -2 implies 5*a + 11*b = 1
a: $int   tff(a_type, type)
b: $int   tff(b_type, type)
$lesseq(−2, $product(a, b)) or $greatereq(−36, $product(a, b))   tff(conj, axiom)
$sum($product(5, a), $product(11, b)) = 1   tff(conj_001, conjecture)

ARI666=1.p 5*a + 11*b = 1 implies a*b ≤ -37 — a*b >= -2
a: $int   tff(a_type, type)
b: $int   tff(b_type, type)
$sum($product(5, a), $product(11, b)) = 1   tff(conj, axiom)
$lesseq(−2, $product(a, b)) or $greatereq(−37, $product(a, b))   tff(conj_001, conjecture)

ARI667=1.p 11*a + 7*b = 1 implies a*b ≤ -40 — a*b >= -6
a: $int   tff(a_type, type)
b: $int   tff(b_type, type)

$\$sum(\$product(11, a), \$product(7, b)) = 1$ tff(conj, axiom)
$\$lesseq(-6, \$product(a, b))$ or $\$greatereq(-40, \$product(a, b))$ tff(conj$_{001}$, conjecture)

ARI668=1.p 11*a + 7*b = 1 and c >= a imply a*c ≤ 0 — a*c >= 4
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
c: \$int tff(c_type, type)
$\$sum(\$product(11, a), \$product(7, b)) = 1$ tff(conj, axiom)
$\$lesseq(a, c)$ tff(conj$_{001}$, axiom)
$\$lesseq(4, \$product(a, c))$ or $\$greatereq(0, \$product(a, c))$ tff(conj$_{002}$, conjecture)

ARI669=1.p a * b * b * c = 0 and a = 0 — b = 0 — c = 0 are equivalent
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
c: \$int tff(c_type, type)
$\$product(\$product(\$product(a, b), b), c) = 0 \iff (c = 0 \text{ or } b = 0 \text{ or } a = 0)$ tff(conj, conjecture)

ARI670=1.p Prove that a*a >= a
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
c: \$int tff(c_type, type)
$\$lesseq(a, \$product(a, a))$ tff(conj, conjecture)

ARI671=1.p a*a = 2 is unsatisfiable
a: \$int tff(a_type, type)
$\$product(a, a) = 2$ tff(conj, axiom)

ARI672=1.p Prove that a*b = 1 and a = b & (a = 1 — a = -1) are equivalent
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
$\$product(a, b) = 1 \iff ((a = -1 \text{ or } a = 1) \text{ and } a = b)$ tff(conj, conjecture)

ARI673=1.p Prove that a*a = 1 and a = 1 — a = -1 are equivalent
a: \$int tff(a_type, type)
$\$product(a, a) = 1 \iff (a = -1 \text{ or } a = 1)$ tff(conj, conjecture)

ARI674=1.p Prove that a*a >= 4 implies a >= 2 — a ≤ -2
a: \$int tff(a_type, type)
$\$lesseq(4, \$product(a, a))$ tff(conj, axiom)
$\$lesseq(a, -2)$ or $\$lesseq(2, a)$ tff(conj$_{001}$, conjecture)

ARI675=1.p Prove that a*a*a*a + a*a + 10 >= 0
a: \$int tff(a_type, type)
$\$lesseq(0, \$sum(\$sum(\$product(\$product(\$product(a, a), a), a), \$product(a, a)), 10))$ tff(conj, conjecture)

ARI676=1.p Prove that a*a + 10 >= 0
a: \$int tff(a_type, type)
$\$lesseq(0, \$sum(\$product(a, a), 10))$ tff(conj, conjecture)

ARI677=1.p Prove that a >= 0 and a*a*a ≤ 0 imply a*a*a*a = 0
a: \$int tff(a_type, type)
$\$greatereq(0, \$product(\$product(a, a), a))$ tff(conj, axiom)
$\$lesseq(0, a)$ tff(conj$_{001}$, axiom)
$\$product(\$product(\$product(a, a), a), a) = 0$ tff(conj$_{002}$, conjecture)

ARI678=1.p Prove that a >= 0 and a*a*a ≤ 7 imply a*a*a*a ≤ 1
a: \$int tff(a_type, type)
$\$greatereq(7, \$product(\$product(a, a), a))$ tff(conj, axiom)
$\$lesseq(0, a)$ tff(conj$_{001}$, axiom)
$\$greatereq(1, \$product(\$product(\$product(a, a), a), a))$ tff(conj$_{002}$, conjecture)

ARI679=1.p Prove equivalence of nonlinear inequalities
d: \$int tff(d_type, type)
c: \$int tff(c_type, type)
$\$lesseq(3, d)$ tff(conj, axiom)
$\$lesseq(2, c)$ tff(conj$_{001}$, axiom)
$\$lesseq(\$product(2, 3), \$product(c, d)) \iff \$lesseq(\$product(2, \$difference(d, 3)), \$product(c, \$difference(d, 3)))$ tff(conj$_{00}$

ARI680=1.p Solve system of nonlinear inequalities
x: \$int tff(x_type, type)
y: \$int tff(y_type, type)
a: \$int tff(a_type, type)
\$greater(4, \$sum(\$product(\$product(3, x), y), \$product(7, a))) tff(conj, axiom)
\$less(3, \$product(2, x)) tff(conj$_{001}$, axiom)
\$less(1, y) tff(conj$_{002}$, axiom)
\$greater(0, a) tff(conj$_{003}$, conjecture)

ARI681=1.p 0 < a * b, 0 < c * d, 0 < a * c imply 0 < b * d
a: \$int tff(a_type, type)
c: \$int tff(c_type, type)
d: \$int tff(d_type, type)
b: \$int tff(b_type, type)
\$less(0, \$product(a, c)) tff(conj, axiom)
\$less(0, \$product(c, d)) tff(conj$_{001}$, axiom)
\$less(0, \$product(a, b)) tff(conj$_{002}$, axiom)
\$less(0, \$product(b, d)) tff(conj$_{003}$, conjecture)

ARI682=1.p 0 ≤ a, a < b imply a+1 ≤ a*b + b
b: \$int tff(b_type, type)
a: \$int tff(a_type, type)
\$less(a, b) tff(conj, axiom)
\$lesseq(0, a) tff(conj$_{001}$, axiom)
\$lesseq(\$sum(a, 1), \$sum(\$product(a, b), b)) tff(conj$_{002}$, conjecture)

ARI683=1.p Solve system of nonlinear inequalities
b: \$int tff(b_type, type)
c: \$int tff(c_type, type)
g: \$int tff(g_type, type)
h: \$int tff(h_type, type)
a: \$int tff(a_type, type)
f: \$int tff(f_type, type)
i: \$int tff(i_type, type)
d: \$int tff(d_type, type)
e: \$int tff(e_type, type)
\$lesseq(\$sum(\$product(a, f), \$product(−1, \$product(a, h))), \$sum(\$sum(b, \$product(c, g)), \$product(−1, \$product(c, h))))
\$lesseq(g, f) tff(conj$_{001}$, axiom)
\$less(h, g) tff(conj$_{002}$, axiom)
\$less(i, h) tff(conj$_{003}$, axiom)
\$lesseq(a, d) tff(conj$_{004}$, axiom)
\$less(e, a) tff(conj$_{005}$, axiom)
\$lesseq(\$sum(\$product(e, f), \$product(−1, \$product(e, i))), \$sum(\$sum(\$sum(\$sum(b, \$product(c, g)), \$product(−1, \$product

ARI684=1.p Expand polynomial a * (a + b) * c
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
c: \$int tff(c_type, type)
\$product(\$product(a, \$sum(a, b)), c) = \$sum(\$product(\$product(a, a), c), \$product(\$product(a, b), c)) tff(conj, conjecture

ARI685=1.p Expand and rewrite polynomial
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
c: \$int tff(c_type, type)
d: \$int tff(d_type, type)
\$sum(\$sum(\$sum(\$product(a, a), \$product(\$product(\$sum(a, b), \$sum(\$sum(c, d), 1)), \$sum(a, 2))), b), \$product(−1, \$product
0 tff(eq, axiom)
\$sum(\$product(\$product(d, b), a), \$product(−1, \$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$differenc
0 tff(conj, conjecture)

ARI686=1.p Expand and rewrite polynomial
a: \$int tff(a_type, type)
\$product(\$product(5, a), a) = \$product(2, a) tff(eq$_1$, axiom)

$product(a, $sum(a, $product(−1, $product($product(2, a), $sum(a, $product($product(3, a), $sum(a, $product(−1, $product(
0 tff(eq$_2$, axiom)
$sum($product(2, $product($product($product($product($product($product($product(a, a), a), a), a), a), a), a)), $product(−
0 tff(conj, conjecture)

ARI687=1.p Expand and rewrite polynomial
x: $int tff(x_type, type)
y: $int tff(y_type, type)
$sum($sum($sum($product($product($product(x, x), x), y), $product($product(x, x), y)), $product($product($product(3, x),
0 tff(eq$_1$, axiom)
$sum($sum($sum($sum($difference($sum($product($product($product($product(2, x), x), x), y), $product(−1, $product(x, y
0 tff(eq$_2$, axiom)
$difference($sum($sum($sum($sum($product($product($product(3, x), x), y), $product($product(2, x), y)), y), $product($pro
0 tff(eq$_3$, axiom)
$sum($product(2, $product($product(x, x), x)), $product(−1, $sum($product(5, x), $product(5, $product(x, x))))) =
0 tff(conj, conjecture)

ARI688=1.p Verify gcd computation
x: $int tff(x_type, type)
a: $int tff(a_type, type)
b: $int tff(b_type, type)
$product(98164184, x) = a tff(eq$_1$, axiom)
$product(6472, x) = b tff(eq$_2$, axiom)
$sum($product(8, x), $product(−1, $difference($product(4353078, b), $product(287, a)))) = 0 tff(conj, conjecture)

ARI689=1.p Rewrite polynomial using linear equations
y: $int tff(y_type, type)
a: $int tff(a_type, type)
x: $int tff(x_type, type)
b: $int tff(b_type, type)
$product(98164184, y) = a tff(eq$_1$, axiom)
$product(6472, x) = b tff(eq$_2$, axiom)
$sum($product(1, $product($product(y, x), b)), $product(−1, $sum($sum($product(166, $product($product(x, b), a)), $produc
0 tff(conj, conjecture)

ARI690=1.p Solve simple system of linear equations
c: $int tff(c_type, type)
d: $int tff(d_type, type)
a: $int tff(a_type, type)
$product(2, d) = a tff(eq$_1$, axiom)
$difference(c, d) = 0 tff(eq$_2$, axiom)
a = $product(2, c) tff(conj, conjecture)

ARI691=1.p Rewrite modulo commutativity of multiplication
a: $int tff(a_type, type)
b: $int tff(b_type, type)
f: $int → $int tff(f_type, type)
$product(a, b) = f($product(a, b)) tff(eq, axiom)
f(f($product(a, b))) = $product(b, a) tff(conj, conjecture)

ARI692=1.p Solve simple system of linear equations
z: $int tff(z_type, type)
x: $int tff(x_type, type)
y: $int tff(y_type, type)
$sum($product(2, z), x) = 2 tff(eq$_1$, axiom)
$sum($product(2, y), $product(3, x)) = 1 tff(eq$_2$, axiom)

ARI693=1.p Solve simple system of linear equations
x: $int tff(x_type, type)
a: $int tff(a_type, type)
z: $int tff(z_type, type)
y: $int tff(y_type, type)
$sum($product(3, x), $product(5, a)) = 1 tff(eq$_1$, axiom)

$\$sum(\$product(7, z), \$product(-1, \$product(17, x))) = 4$ tff(eq$_2$, axiom)
$\$sum(\$sum(\$product(2, y), \$product(7, x)), \$product(-1, \$product(-1, 34))) = 0$ tff(eq$_3$, axiom)
$\$remainder\_t(\$sum(z, 116), 170) = 0$ tff(conj, conjecture)

ARI694=1.p Solve simple system of linear equations
x_0: \$int tff(x0_type, type)
x_1: \$int tff(x1_type, type)
x_2: \$int tff(x2_type, type)
x_3: \$int tff(x3_type, type)
x_4: \$int tff(x4_type, type)
x_5: \$int tff(x5_type, type)
x_6: \$int tff(x6_type, type)
x_7: \$int tff(x7_type, type)
x_8: \$int tff(x8_type, type)
x_9: \$int tff(x9_type, type)
$x_0 = \$sum(\$product(5, x_1), 1)$ tff(eq$_1$, axiom)
$\$product(4, x_1) = \$sum(\$product(5, x_2), 1)$ tff(eq$_2$, axiom)
$\$product(4, x_2) = \$sum(\$product(5, x_3), 1)$ tff(eq$_3$, axiom)
$\$product(4, x_3) = \$sum(\$product(5, x_4), 1)$ tff(eq$_4$, axiom)
$\$product(4, x_4) = \$sum(\$product(5, x_5), 1)$ tff(eq$_5$, axiom)
$\$product(4, x_5) = \$sum(\$product(5, x_6), 1)$ tff(eq$_6$, axiom)
$\$product(4, x_6) = \$sum(\$product(5, x_7), 1)$ tff(eq$_7$, axiom)
$\$product(4, x_7) = \$sum(\$product(5, x_8), 1)$ tff(eq$_8$, axiom)
$\$product(4, x_8) = \$sum(\$product(5, x_9), 1)$ tff(eq$_9$, axiom)
$\$remainder\_t(\$sum(x_0, 4), 1953125) = 0$ tff(conj, conjecture)

ARI695=1.p <A one line description of the problem>
d: \$int tff(d_type, type)
c: \$int tff(c_type, type)
$\$sum(\$product(\$product(-1, d), \$sum(2, c)), \$product(-1, \$product(d, \$difference(\$product(-1, 2), c)))) = 0$ tff(conj, con

ARI696=1.p Expand and rewrite polynomial
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
c: \$int tff(c_type, type)
d: \$int tff(d_type, type)
$\$sum(\$sum(\$sum(\$product(a, a), \$product(\$product(\$sum(a, b), \$sum(\$difference(c, d), 1)), \$difference(a, 2))), b), \$product(-$
0 tff(eq, axiom)
$\$sum(\$sum(\$product(\$product(d, b), a), \$product(c, b)), \$product(-1, \$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum($
0 tff(conj, conjecture)

ARI697=1.p Solve simple system of linear equations
x_1: \$int tff(x1_type, type)
x_2: \$int tff(x2_type, type)
x_3: \$int tff(x3_type, type)
x_4: \$int tff(x4_type, type)
x_5: \$int tff(x5_type, type)
$\$sum(\$difference(\$sum(\$difference(\$product(-1, \$product(2, x_2)), \$product(5, x_1)), x_3), x_4), x_5) = 0$ tff(eq$_1$, axiom)
$\$sum(\$sum(\$sum(\$sum(\$product(9, x_1), \$product(62, x_2)), \$product(-1, \$product(5, x_3))), \$product(-1, \$product(3, x_4))), \$$
0 tff(eq$_2$, axiom)
$\$sum(\$sum(\$sum(\$sum(\$product(56, x_1), \$product(-1, \$product(34, x_2))), \$product(-1, \$product(11, x_3))), \$product(67, x_4)$
0 tff(eq$_3$, axiom)
$\$remainder\_t(x_5, 2) = 0$ tff(conj, conjecture)

ARI698=1.p Solve simple system of linear equations, with parameter N
n: \$int tff(x_type, type)
x_6: \$int tff(x6_type, type)
x_5: \$int tff(x5_type, type)
x_4: \$int tff(x4_type, type)
x_3: \$int tff(x3_type, type)
x_2: \$int tff(x2_type, type)
x_1: \$int tff(x1_type, type)

$n = 1000$ tff(eq$_1$, axiom)
$\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{product}(1, x_6), \$\text{product}(n, x_5)), \$\text{product}(n, x_4)), \$\text{product}(n, x_3)), \$\text{product}(n, x_2)),$ \$produc
0 tff(eq$_2$, axiom)
$\$\text{difference}(\$\text{difference}(\$\text{difference}(\$\text{difference}(\$\text{difference}(\$\text{product}(n, x_6), x_5), x_4), x_3), x_2), x_1) = 0$ tff(eq$_3$, axiom)
$\$\text{difference}(\$\text{difference}(\$\text{difference}(\$\text{difference}(\$\text{sum}(\$\text{product}(n, x_6), \$\text{product}(1, x_5)), x_4), x_3), x_2), x_1) = 0$ tff(eq$_4$, axiom
$\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{product}(n, x_6), \$\text{product}(0, x_5)), \$\text{product}(1, x_4)), \$\text{product}(1, x_3)), \$\text{product}(1, x_2)),$ \$product
0 tff(eq$_5$, axiom)
$\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{difference}(\$\text{sum}(\$\text{product}(n, x_6), \$\text{product}(0, x_5)), x_4), \$\text{product}(1, x_3)), \$\text{product}(1, x_2)), \$\text{product}(1, x_1))$
0 tff(eq$_6$, axiom)
$\$\text{difference}(\$\text{difference}(\$\text{difference}(\$\text{sum}(\$\text{sum}(\$\text{product}(n, x_6), \$\text{product}(0, x_5)), \$\text{product}(0, x_4)), x_3), x_2), x_1) = 0$ tff(eq$_7$
$\$\text{difference}(\$\text{difference}(\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{product}(n, x_6), \$\text{product}(0, x_5)), \$\text{product}(0, x_4)), \$\text{product}(1, x_3)), x_2), x_1) =$
0 tff(eq$_8$, axiom)
$\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{product}(n, x_6), \$\text{product}(0, x_5)), \$\text{product}(0, x_4)), \$\text{product}(0, x_3)), \$\text{product}(1, x_2)),$ \$product
0 tff(eq$_9$, axiom)
$\$\text{sum}(\$\text{difference}(\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{product}(n, x_6), \$\text{product}(0, x_5)), \$\text{product}(0, x_4)), \$\text{product}(0, x_3)), x_2), \$\text{product}(1, x_1))$
0 tff(eq$_{10}$, axiom)
$\$\text{difference}(\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{sum}(\$\text{product}(n, x_6), \$\text{product}(0, x_5)), \$\text{product}(0, x_4)), \$\text{product}(0, x_3)), \$\text{product}(0, x_2)), x_1)$
0 tff(eq$_{11}$, axiom)
$x_6 = 0$ and $x_5 = 0$ and $x_4 = 0$ and $x_3 = 0$ and $x_2 = 0$ and $x_1 = 0$ tff(conj, conjecture)

ARI699=1.p Nonlinear inequality reasoning
z: \$int tff(z_type, type)
x: \$int tff(x_type, type)
y: \$int tff(y_type, type)
$\$\text{greater}(x, 0)$ tff(ineq$_1$, axiom)
$\$\text{greater}(y, 0)$ tff(ineq$_2$, axiom)
$\$\text{lesseq}(0, \$\text{sum}(\$\text{product}(\$\text{product}(z, z), x), \$\text{product}(-1, \$\text{product}(y, x))))$ tff(ineq$_3$, axiom)
$\$\text{product}(\$\text{product}(2, z), z) = y$ tff(eq, axiom)

ARI700=1.p Solve a simple system of nonlinear equations
y: \$int tff(y_type, type)
a: \$int tff(a_type, type)
x: \$int tff(x_type, type)
b: \$int tff(b_type, type)
$\$\text{product}(\$\text{product}(98164184, y), y) = a$ tff(eq$_1$, axiom)
$\$\text{product}(\$\text{product}(6472, x), y) = b$ tff(eq$_2$, axiom)
$\$\text{product}(5235848, \$\text{product}(\$\text{product}(\$\text{product}(123, x), x), a)) = \$\text{product}(12270523, \$\text{product}(\$\text{product}(123, b), b))$ tff(c

ARI701=1.p Solve a simple system of nonlinear equations
x: \$int tff(x_type, type)
y: \$int tff(y_type, type)
a: \$int tff(a_type, type)
z: \$int tff(z_type, type)
b: \$int tff(b_type, type)
$\$\text{product}(x, y) = a$ tff(eq$_1$, axiom)
$\$\text{product}(y, z) = b$ tff(eq$_2$, axiom)
$\$\text{product}(a, z) = 1$ tff(eq$_3$, axiom)
$\$\text{product}(\$\text{product}(z, y), x) = 1$ tff(conj, conjecture)

ARI702=1.p Solve a simple system of nonlinear equations
x: \$int tff(x_type, type)
y: \$int tff(y_type, type)
a: \$int tff(a_type, type)
z: \$int tff(z_type, type)
b: \$int tff(b_type, type)
$\$\text{product}(\$\text{product}(2, x), y) = a$ tff(eq$_1$, axiom)
$\$\text{product}(\$\text{product}(2, y), z) = b$ tff(eq$_2$, axiom)
$\$\text{product}(a, z) = 2$ tff(eq$_3$, axiom)
$\$\text{product}(\$\text{product}(x, y), z) = 1$ tff(conj, conjecture)

ARI703=1.p Sum-of-squares decomposition
x: \$int tff(x_type, type)

y: \$int tff(y_type, type)
z: \$int tff(z_type, type)
t: \$int tff(t_type, type)
u: \$int tff(u_type, type)
v: \$int tff(v_type, type)
w: \$int tff(w_type, type)
\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$product(x, x), \$product(y, y)), \$product(z, z)), \$product(t, t)), \$product(u, u)), \$product
1234567890987654321 tff(eq, axiom)

ARI704=1.p Solve simple system of linear equations
x_6: \$int tff(x6_type, type)
x_5: \$int tff(x5_type, type)
x_3: \$int tff(x3_type, type)
x_4: \$int tff(x4_type, type)
x_2: \$int tff(x2_type, type)
$x_6 = 0$ tff(eq_1, axiom)
\$sum(\$product($2, x_5$), \$product($1, x_3$)) $= 0$ tff(eq_2, axiom)
\$sum(\$product($5, x_4$), \$product($3, x_2$)) $= 0$ tff(eq_3, axiom)
\$sum(\$product($7, x_3$), \$product($11, x_2$)) $= 0$ tff(eq_4, axiom)

ARI705=1.p Simple rewriting: d*d = d*d + a implies d*c*a*b*2 = 0
d: \$int tff(d_type, type)
a: \$int tff(a_type, type)
c: \$int tff(c_type, type)
b: \$int tff(b_type, type)
\$product(d, d) = \$sum(\$product(d, d), a) tff(eq, axiom)
\$product(\$product(\$product(\$product(d, c), a), b), 2) = 0 tff(conj, conjecture)

ARI706=1.p Simple rewriting: d*d = 2*d*d implies d*d = d*3*d
d: \$int tff(d_type, type)
\$product(d, d) = \$product(\$product($2, d$), d) tff(eq, axiom)
\$product(d, d) = \$product(\$product($d, 3$), d) tff(conj, conjecture)

ARI707=1.p Simple rewriting: d*d + c = 2*d*d implies c*d*d = c*c
d: \$int tff(d_type, type)
c: \$int tff(c_type, type)
\$sum(\$product(d, d), c) = \$product(\$product($2, d$), d) tff(eq, axiom)
\$product(\$product(c, d), d) = \$product(c, c) tff(conj, conjecture)

ARI708=1.p Expand and rewrite polynomials
a: \$int tff(a_type, type)
c: \$int tff(c_type, type)
d: \$int tff(d_type, type)
b: \$int tff(b_type, type)
\$sum(a, \$product(-1, \$product(\$sum(c, d), \$sum(d, c)))) = 0 tff(eq_1, axiom)
\$product(\$difference(c, d), \$difference(c, d)) = b tff(eq_2, axiom)
\$sum(\$sum(a, b), \$product(-1, \$product(2, \$sum(\$product(c, c), \$product(d, d))))) = 0 tff(conj, conjecture)

ARI709=1.p Simple rewriting: a * 1 = 3 implies a = 3
a: \$int tff(a_type, type)
\$product($1, a$) = 3 tff(eq, axiom)
$a = 3$ tff(conj, conjecture)

ARI710=1.p Simple rewriting: b * 1 = a*c*d implies b = d*a*c
b: \$int tff(b_type, type)
a: \$int tff(a_type, type)
c: \$int tff(c_type, type)
d: \$int tff(d_type, type)
\$product($b, 1$) = \$product(\$product(a, c), d) tff(eq, axiom)
b = \$product(\$product(d, a), c) tff(conj, conjecture)

ARI711=1.p Expand the equation (a+b+c+1)∧4 = 0
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)

c: \$int tff(c_type, type)
\$product(\$product(\$product(\$sum(\$sum(\$sum(a, b), c), 1), \$sum(\$sum(\$sum(a, b), c), 1)), \$sum(\$sum(\$sum(a, b), c), 1)), \$sum
0 tff(eq, axiom)
\$sum(\$product(\$product(\$product(c, c), c), c), \$product(-1, \$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$sum(\$su
0 tff(conj, conjecture)

ARI712=1.p Expand and rewrite polynomial
a: \$int tff(a_type, type)
b: \$int tff(b_type, type)
c: \$int tff(c_type, type)
d: \$int tff(d_type, type)
\$sum(\$sum(\$sum(\$product(a, a), \$product(\$sum(\$product(\$product(a, b), c), \$product(\$product(b, d), a)), \$sum(\$sum(\$prod
0 tff(eq, axiom)
\$sum(\$product(1, \$product(\$product(\$product(\$product(\$product(d, d), d), b), b), a)), \$product(-1, \$sum(\$sum(\$sum(\$sum(\$
0 tff(conj, conjecture)

ARI713=1.p ceiling is idempotent
$\forall x$: \$real: \$ceiling(\$ceiling(x)) = \$ceiling(x) tff(prove, conjecture)

ARI714=1.p floor(X+1) = floor(X)+1
$\forall x$: \$real: \$floor(\$sum(x, $1._0$)) = \$sum(\$floor(x), $1._0$) tff(prove, conjecture)

ARI715=1.p floor(X+0.3) != floor(X)+0.3
$\forall x$: \$real: \$floor(\$sum(x, $0._3$)) $\neq$ \$sum(\$floor(x), $0._3$) tff(prove, conjecture)

ARI716=1.p floor(X+0.5) >= floor(X)
$\forall x$: \$real: \$greatereq(\$floor(\$sum(x, $0._5$)), \$floor(x)) tff(prove, conjecture)

ARI717=1.p floor(X+0.5) can be greater than X
$\exists x$: \$real: \$greater(\$floor(\$sum(x, $0._5$)), x) tff(prove, conjecture)

ARI718=1.p floor(X+0.5) can be less than X
$\exists x$: \$real: \$less(\$floor(\$sum(x, $0._5$)), x) tff(prove, conjecture)

ARI719=1.p floor(X+0.5) can be equal to floor(X-0.3)
$\exists x$: \$real: \$floor(\$sum(x, $0._5$)) = \$floor(\$sum(x, $-0._3$)) tff(prove, conjecture)

ARI720=1.p floor(X+0.5) > floor(X-0.5)
$\forall x$: \$real: \$greater(\$floor(\$sum(x, $0._5$)), \$floor(\$sum(x, $-0._5$))) tff(prove, conjecture)

ARI721=1.p floor(X+1.5) > X
$\forall x$: \$real: \$greater(\$floor(\$sum(x, $1._5$)), x) tff(prove, conjecture)

ARI722=1.p If floor(X) = X, then X is an integer
$\forall x$: \$real: (x = \$floor(x) $\Rightarrow$ \$is_int(x)) tff(prove, conjecture)

ARI723=1.p If ceiling(X) = floor(X), then X is an integer
$\forall x$: \$real: (\$ceiling(x) = \$floor(x) $\Rightarrow$ \$is_int(x)) tff(prove, conjecture)

ARI724=1.p floor(2*X) >= 2*floor(X)
$\forall x$: \$real: \$greatereq(\$floor(\$product($2._0$, x)), \$product($2._0$, \$floor(x))) tff(prove, conjecture)

ARI725=1.p floor(2*X) can be greater than 2*floor(X)
$\exists x$: \$real: \$greater(\$floor(\$product($2._0$, x)), \$product($2._0$, \$floor(x))) tff(prove, conjecture)

ARI726=1.p There is an integer X such that 0.4*X > 1 and 0.3*X < 1
$\exists x$: \$real: (\$is_int(x) and \$greater(\$product($0._4$, x), $1._0$) and \$less(\$product($0._3$, x), $1._0$)) tff(prove, conjecture)

ARI727=1.p Every integer is greater than 3.8 or less than 3.2
$\forall x$: \$real: (\$is_int(x) $\Rightarrow$ (\$greater(x, $3._8$) or \$less(x, $3._2$))) tff(prove, conjecture)

ARI728=1.p If 2*X is an integer, then X is an integer or X+0.5 is an integer
$\forall x$: \$real: (\$is_int(\$product($2._0$, x)) $\Rightarrow$ (\$is_int(x) or \$is_int(\$sum(x, $0._5$)))) tff(prove, conjecture)

ARI729=1.p If floor(X)=floor(Y), the X-Y < 1
$\forall x$: \$real, y: \$real: (\$floor(x) = \$floor(y) $\Rightarrow$ \$less(\$difference(x, y), $1._0$)) tff(prove, conjecture)

ARI730=1.p If X =< 7.2 and X is an integer, then X =< 7
$\forall x$: \$real: ((\$is_int(x) and \$lesseq(x, $7._2$)) $\Rightarrow$ \$lesseq(x, $7._0$)) tff(prove, conjecture)

ARI731=1.p If X is an integer, then 2*X+3 is an integer
$\forall x$: \$real: (\$is_int(x) $\Rightarrow$ \$is_int(\$sum(\$product(x, $2._0$), $3._0$))) tff(prove, conjecture)

ARI732=1.p If X is an integer and 5*X+Y is an integer, then Y is an integer
$\forall x$: \$real, y: \$real: ((\$is_int(x) and \$is_int(\$sum(\$product($5._0, x$), y))) $\Rightarrow$ \$is_int(y)) tff(prove, conjecture)

ARI733=1.p Real inequation system has a solution with integer X
$\exists x$: \$real, y: \$real: (\$is_int(x) and \$lesseq(\$sum(\$product($-1._5, x$), y), $0._{25}$) and \$lesseq(\$sum(\$product($4._0, x$), y), $30._5$) and \$

ARI734=1.p Verification example
$\forall i$: \$int: (\$greatereq($i, 0$) $\Rightarrow$ $\exists \mathrm{res}_1$: \$int: ($\exists \mathrm{res1}_2$: \$int: ($\exists i_3$: \$int: (i_3 = \$difference($i, 1$) and $\mathrm{res1}_2$ = \$product($2, i_3$)) and (i = $0 \Rightarrow \mathrm{res}_1 = 0$) and ($i \neq 0 \Rightarrow \mathrm{res}_1$ = \$sum($\mathrm{res1}_2, 2$))) and res_1 = \$product($2, i$))) tff(formula, conjecture)

ARI735=1.p Verification example
$\forall i$: \$int: (\$greatereq($i, 0$) $\Rightarrow$ (($i = 0 \Rightarrow$ \$true) and ($i \neq 0 \Rightarrow \exists i_1$: \$int: (i_1 = \$difference($i, 1$) and \$greatereq($i_1, 0$))))) tff