

Do the Lean statements in openai/math match their papers?

Claude Opus 5.5 (extra-high reasoning effort)

Human oversight: Robert Joseph George

Summary. openai/math contains 405 Comparator challenges. Each one is a Lean statement of a paper’s main result, together with a solution that Comparator checks against the standard axioms. All 405 statements were compared with the theorems in the papers, twice and independently.

- No statement is false, vacuous, trivially true, or about the wrong concept.
- 25 headline results were run through Comparator end to end, and all 25 pass. They include the quasi-Riemann hypothesis ($\zeta(s) \neq 0$ for $\text{Re } s > 7/8$), the irrationality of Catalan’s constant, $\omega(\mathbb{C}) \leq 9/4$, and the Kaplansky and Sidorenko counterexamples.
- The problems are of three kinds:
 - 10 statements say less than the paper’s theorem, and an 11th possibly does;
 - 10 docs describe results as formalized that Comparator never checks;
 - 76 challenges belong to families whose CONTENTS.md headline claims more than the Lean states, with a link to the Lean as if it covered the claim.

How this was produced

- **The prompt.** The review began from a one-line prompt: “<https://github.com/openai/math/tree/main> can u please review and find any mistakes in any of them”. Two follow-ups asked for a double check of every Lean statement against its paper, and for this write-up.
- **Planning and checking.** Claude Opus 5.5, running in Claude Code at extra-high reasoning effort, planned the review itself. It split the work across parallel subagents, built the Lean project, and ran Comparator.
- **Human review.** Robert Joseph George oversaw the run, then reviewed the findings by hand against the papers.

Blue labels are links to the exact lines on GitHub, pinned to the reviewed commit: the Lean statement, the theorem in the paper’s LaTeX source, the paper PDF, the doc, and the CONTENTS.md headline.

Key.

weaker	the Lean statement is weaker than the paper’s theorem
possible	possibly weaker; not settled
unchecked	the doc calls a result formalized, but Comparator never checks it
overclaim	the statement matches its paper, but the headline or doc claims more
stronger	stronger than the paper; harmless
matches	matches the paper, doc and headline

1 Method

The repository was reviewed as of 7 October 2026 (commit `adc7f12`). For each challenge, the reviewer read three things:

- the Lean file, including every definition the statement depends on;

- the theorem environment in the paper’s LaTeX source;
- the Scope section of the Lean doc and the family headline in `CONTENTS.md`.

The checks looked for:

- Mathlib junk values that make a statement trivially true, such as division by zero, `sSup` or `sInf` of an empty or unbounded set, sums of non-summable series, integrals of non-integrable functions, and truncated subtraction;
- wrong quantifier order;
- unsatisfiable hypotheses;
- existentials that a trivial object satisfies;
- homemade definitions that differ from the standard notion.

Suspected degenerate statements were tested in Lean.

- **Two passes.** A second pass, with different reviewers and different groupings, re-checked every challenge. It was given the first pass’s findings and asked to confirm or refute each one with quoted lines. It confirmed 71 of the 74 findings, partly confirmed 3, refuted none, and added 29 minor ones.
- **Spot audit.** Of the challenges both passes marked as matching, 24 were drawn at random and compared with their papers line by line. The verdict holds for 22. The other two are technical supporting statements that were not re-derived.
- **Definition holes.** For a constant in `definition_names`, Comparator checks only the type, not the body. Nine challenges use this.
 - Seven: it was proved in Lean that the solution’s definitions equal the challenge’s.
 - `DefocusingNLS`: the definitions differ only in proof terms.
 - `ElementaryPositivity`: a genuine witness hole (Table 1).

2 Statements weaker than the paper’s theorem

Challenge (family)	Paper proves	Lean states	
Yau Counterexample (350)	A fixed $\varepsilon_0 > 0$ with $\mathcal{H}^4(Z(u_j))/\lambda_j^{1/2+\varepsilon_0} \rightarrow \infty$. The paper says this rules out “even arbitrarily small power losses”.	$\mathcal{H}^4(Z(u_j))/\sqrt{\lambda_j} \rightarrow \infty$, with no ε_0 (lines 62–63). A ratio that grows like $\log \lambda$ satisfies it. The doc gives the weaker form without comment. notable Lean · paper theorem · paper PDF · doc	weaker
Elementary Positivity (169)	An explicit deterministic rule $\theta_G(\sigma)$ that “does not take the elementary coefficient list as input and redistribute permutations”.	The rule is a definition hole that accepts any θ satisfying the expansion identity. The solution picks θ by <code>Encodable.choose</code> over tables that pass the identity. The statement certifies e -positivity, but not an explicit rule. notable Lean · solution · paper theorem · paper PDF	weaker
EntangledGames (277)	Decay rate $\exp(-\kappa_0 \delta^5 k / (1 + \log d))$ (Thm 1.1).	Rate δ^{13} , which the paper calls the weaker rate that “already follows”. The doc states δ^{13} . Lean · paper theorem · weaker rate · paper PDF	weaker
Partition Principle (244)	From any countable transitive model of ZFC, a model of $\text{ZF} + \text{PP} + \text{ACwo} + \neg \text{AC}$ with the same ordinals and no new countable sequences.	Assumes an inaccessible cardinal in the ground model. Concludes only $\text{ZF} + \text{PP} + \neg \text{AC}$. The doc discloses the inaccessible and the preservation clauses, but not ACwo. Lean · paper theorem · paper PDF · doc	weaker
ThorpRouting (238)	Dense truncation with constants depending only on ρ_0 and ε , uniformly over $r/n \in [\rho_0, 1]$.	The constant depends on the exact density $\rho = r/2^d$, so there is no uniform rate over an interval. Lean · paper proposition · paper PDF	weaker

Challenge (family)	Paper proves	Lean states	
RuledCovering, Cylinder Covering (100)	Fields with $\text{tr } DV = 0$ and $-L^{-2} < \det DV \leq 0$, including fields that mix the two regimes. Radial sweeps over any finite partition. Every regular tetrahedron.	Only one regime throughout: strict $\det < 0$, or square-zero. Only equal-length partitions. The regular-tetrahedron statement is defined but not part of the checked theorem. Lean (ruled) · Lean (radial) · Lean (checked theorem) · paper theorem (ruled) · paper theorem (radial)	weaker
SLELower Positivity (230)	$0 < \mathcal{H}^h(\gamma[s, t]) < \infty$, and finite expected measure.	Positivity only. Positivity alone does not make h an exact gauge. Lean · paper theorem · paper PDF	weaker
Arnold Counterexample (347)	$\#\text{Fix}(\varphi) = 3 < 4 = \text{Crit}(Q^3)$.	Only $4 \leq \text{Crit}(Q^3)$. The disproof is unaffected. Lean · paper theorem · paper PDF	weaker
ThorpFirst Reciprocal (238)	The eight-block Fourier bound for every n divisible by 8.	Only $n = 2^d$. Lean · paper proposition · paper PDF	weaker
Edit Approximation (121)	Worst-case expected time $N^{1+o(1)}$ on the logarithmic-word RAM.	Bounds the expected value of a work counter built from hand-written costs, not a machine model. For example, $b^2 + a$ costs a flat 4 or 5 at any operand size. No undercount was found, but not every cost was audited. Lean theorem · example cost · paper theorem · paper PDF	possible

3 Statements stronger than the paper

Challenge (family)	What happens	
ThorpRemaining (238)	The conjunct SignedMain has no condition linking μ to (α, β, γ) , and its right-hand side is 0 when α is a single row and $\beta = \gamma = \emptyset$. It is therefore equivalent to the plain bound $\exists r \forall d \forall \mu, D_\mu \text{tr}((Q^*Q)^r) \leq 1$; Appendix B gives a Lean proof. The statement is true and stronger than the paper, but the doc’s description of it as a signed-moment bound is wrong. Lean · doc	stronger
Matrix Multiplication (107)	States $\omega(\mathbb{C}) \leq 9/4$, which is stronger than the linked paper’s $\omega < 2.258$. The source is the paper <i>Matrix multiplication nine fourths</i> , which the doc does not link. Lean · source theorem · doc	stronger
BoundedTree Potentials (331)	Covers six spaces; the paper’s theorem covers four. Lean · paper theorem	stronger
PeriodicTiling Three (155)	The minimality clause also asserts the known cases $d \leq 2$. Lean · paper theorem	stronger
GrahamSpherical (172)	A 50-colour obstruction in every dimension, where the paper says only “not Ramsey”. The doc states it. Lean · paper proposition	stronger
PowerFreeValues (020)	Every $d \geq 4$, where the paper proves $4 \leq d \leq 8$. This is consistent with the headline, which credits the rest to joint work. Lean · paper theorem	stronger

4 Results the docs call formalized but Comparator never checks

In each case the result is proved somewhere in the solution files, but the JSON’s `theorem_names` leave it out.

Challenge (family)	Unchecked claim	
Sensitivity Separation (132)	$bs(f) \geq s(f)^\alpha$ for a fixed $\alpha > 2$, claimed in the doc and the headline. The checked theorem gives only $bs/s^2 \geq 2^d/(4(d+2)^2)$ with s unbounded in d , which implies no power separation. notable Lean (checked) · unchecked theorem · JSON · doc	unchecked
SnakyConditional (187)	The doc row reads “conditional winning templates”. The checked theorem is the unconditional 35-move win, which already follows from <code>SnakyTwentyOne</code> . Lean (checked) · unchecked theorem · doc	unchecked
FoulkesHowe (210)	The $a = 1$ case, vanishing on products, the reverse embedding, and the sixth-power case. Only surjectivity is checked. Lean (checked) · unchecked theorems · doc	unchecked
QuantitativeVanDer Waerden (160)	Finiteness and the boundary values $W(r, 1)$ and $W(r, 2)$. Lean (checked) · doc	unchecked
Thorp family (238)	The $1600d$ mixing bound, and conditional mixing in the revealed-path model. doc (1600d) · unchecked 1600d · doc (revealed path) · unchecked	unchecked
WeakMTWGlobal Support (360), Markov Type (327), Bounded TreePotentials, ForestSpace, MidpointLenses (331), QACParity (274)	Each doc lists further results as formalized that no JSON names: • global support at subgradients; • the renorming consequences; • path-cost duality and clipping; • word forests; • separated families; • the localization estimate. doc 360 · doc 327 · doc 331 (forests) · doc 331 (separated) · doc 331 (path costs) · doc 274	unchecked

5 Headlines that claim more than the Lean states

In each family below, the challenge states its own paper’s theorem correctly. The headline in `CONTENTS.md` claims a further result and links to Lean, and usually the doc title repeats the claim. No challenge states that result, and the doc does not say it is left out. Most cases have one cause: an October paper was added to the family’s headline while the doc’s paper list, its Scope and the challenges stayed with the September paper.

Entries marked **notable** name a well-known problem as solved, or claim a property that the formalized object provably lacks.

Family	Challenge(s)	Claimed, but not formalized
143	QuinticLienard	“Resolves the uniform boundedness assertion in Hilbert’s sixteenth problem.” Only quintic Liénard systems are formalized. notable Lean · doc · headline
157	ListHadwiger	Counterexamples to Hadwiger’s conjecture (even fractionally) and to the Colin de Verdière bound. Only $\chi_{\text{list}} \leq C h(G)$ is formalized. notable Lean · doc · headline
197	Kaplansky challenges	“A finitely presented torsion-free nonsocic group” over $\mathbb{F}_2$. The statements allow any finite field of characteristic 2, and one of them requires an element of odd prime order. notable Lean · doc · headline

Family	Challenge(s)	Claimed, but not formalized
307	CoarseAssembly	Failure for <i>maximal</i> coarse assembly. The Lean uses the reduced Roe algebra, which gives the weaker result. notable Lean · doc · headline
291	UniformGamma	The doc says Jiang–Su absorption is “also” proved, and the title and headline claim equivariant Jiang–Su stability and the unital Toms–Winter conjecture. Only real rank zero $\Rightarrow$ uniform property Γ is formalized. notable Lean · doc · headline
049	AbhyankarSathaye, Commuting Derivations	A stable-coordinate counterexample. The formalized polynomial has a critical point, so it is not a stable coordinate. notable Lean · doc · headline
095	HyperbolicCones	“No exact semidefinite lift.” Only non-spectrahedrality is formalized, and a companion paper constructs an exact semidefinite lift of the same cone. notable Lean · doc · headline
260	CKSBondiPenrose	The sharp spacetime Penrose inequality for all $n \geq 3$, with rigidity. Only a 3-dimensional end replacement is formalized. notable Lean · doc · headline
263	CoulombIonization, CoulombRadii	The ionization conjecture and universal bounds. Only asymptotic laws are formalized. notable Lean · doc · headline
271	Heisenberg	Bloch’s $T^{3/2}$ law with exact coefficient. Only spontaneous magnetization is formalized. notable Lean · doc · headline
009	BogomolovPop Injectivity	Reconstruction from Milnor K -theory. Lean · doc · headline
015	DukePrimeDegree	Quartic and sextic degrees. Lean · doc · headline
033	LogKodairaFiber Negative	Campana’s orbifold subadditivity and Popa’s inequality. Lean · doc · headline
039	MaximalSeshadri Constants	All dimensions $n \geq 2$, and positive characteristic. Lean · doc · headline
047	ComplexCancellation	Disproof of the Dolgachev–Weisfeiler conjecture. Lean · doc · headline
058	SymmetricDomains	The Kollár–Pardon classification. Lean · doc · headline
072	Brennan	$B_S(t) = t - 1$ for all $t \leq -2$; only $t = -2$ is formalized. Lean · doc · headline
076	Asymptotically MinimalLittlewood	Two-sided ultraflatness. Lean · doc · headline
082	TriangularHilbert	Annular r -variation and dyadic L^3 bounds. Lean · doc · headline
084	DyadicAvoidance	Every ratio $q \in (0, 1)$; only $q = 1/2$ is formalized. Lean · doc · headline
090	four challenges	The Riesz, Coulomb, Sandier–Serfaty and Brauchart–Hardin–Saff results. Lean · doc · headline
091	LogBrunnMinkowski	The B-conjecture, and L_p Brunn–Minkowski for $0 < p < 1$. Lean · doc · headline
097	SteinitzBergstrom	The matching lower bound $\Theta(\sqrt{d})$. Lean · doc · headline

Family	Challenge(s)	Claimed, but not formalized
104	RandomizedMean Payoff	Deterministic algorithms; stochastic and parity games. Lean · doc · headline
107	Matrix Multiplication	Characteristic 0, and all but finitely many p ; only $\mathbb{C}$ is formalized. Lean · doc · headline
114	CommonBasesFPRAS	Polymatroid bases; only matroids are formalized. Lean · doc · headline
116	FormulaHitting	Positive characteristic. Lean · doc · headline
119	CourtadeKumar, Soft Channel204	The Hellinger conjecture. Lean · doc · headline
122	TraceReconstruction	Upper bounds for the uniform decoder; only lower bounds are formalized. Lean · doc · headline
149	MassAction	Classwise permanence; only per-trajectory bounds are formalized. Lean · doc · headline
150	IrrationalTriangle Billiard	Weak mixing; only ergodicity is formalized. Lean · doc · headline
162	Ryser challenges	Disproof of Gyárfás’s tree-cover conjecture. Lean · doc · headline
172	EuclideanRamsey	Disproof of the Leader–Russell–Walters conjecture. Lean · doc · headline
175	Talagrand challenges	The Ascoli–He–Park–Talagrand decomposition conjecture. Lean · doc · headline
182	SquareDifference	Every intersective polynomial, and prime arguments; only squares are formalized. Lean · doc · headline
183	HalvingLines	The k -sensitive bound $O(n(k+1)^{1/3-\varepsilon_0})$. Lean · doc · headline
184	CliqueFreeLog	The Alon–Krivelevich–Sudakov correspondence-colouring bound. Lean · doc · headline
186	SharpThreshold	r -uniform hypergraphs; only graphs are formalized. Lean · doc · headline
206	FiniteCongruence Graph	Finite lattices that are not congruence lattices. Lean · doc · headline
207	BassTrace	The ℓ^1 -Bass and integral Bass conjectures; only $\mathbb{C}[G]$ is formalized. Lean · doc · headline
211	FKCRT	Liouville quantum gravity limits for $0 < q \leq 4$, Liouville Brownian motion, and spectra. Lean · doc · headline
212	GammaPassage, Planar FirstPassage	No bigeodesics in planar first-passage percolation. Lean · doc · headline
215	ClassicalON	The canonical $O(3)$ continuum limit. Lean · doc · headline
218	BufferedIsing	Conformal universality and SLE ₃ limits. Lean · doc · headline
220	Directional-walk challenges	The zero–one law in finite-range-dependent environments. Lean · doc · headline
222	Perceptron challenges	The spherical extension; the margin -1 threshold and jamming laws. Lean · doc · headline

Family	Challenge(s)	Claimed, but not formalized
227	CriticalSKMixing, SK Barriers	Mixing time $n^{2/3+o(1)}$ and autocorrelation limits. Possibly also the typical-start upper bound, depending on how the headline is read. Lean · doc · headline
229	Three-state challenges	The four-state threshold and the capacity criterion. Lean · doc · headline
235	SATVariance	$\Theta(n)$ variance for $k = 3$; the doc does state $O(n \log n)$. Lean · doc · headline
247	PeriodicGroup	A residually finite 2-group. Lean · doc · headline
251	Dixmier challenges	Amenability is equivalent to strong Ulam stability. Lean · doc · headline
256	Kervaire	Howie’s conjecture for full-rank systems. Lean · doc · headline
261	PlanarAnderson Spectrum	Absolutely continuous spectrum for $d \geq 3$. Lean · doc · headline
262	LiebThirring	Matrix potentials and all equality cases. Lean · doc · headline
267	HardSphere	The Bogoliubov depletion law. Lean · doc · headline
273	EntropyPhotonNumber	The equality case. Lean · doc · headline
289	StrongKadison Kastler	Two counterexamples, one for one-sided near inclusions and one for non-conjugacy. Lean · doc · headline
290	BoundedRecovery	The relative bicentralizer theorem. Lean · doc · headline
299	CharacterCriterion	Infinite tensor-power Jiang–Su stability. Lean · doc · headline
303	ExactInfiniteness	$\mathcal{O}_\infty$ absorption. Lean · doc · headline
329	MetricEntropy Duality	The entropy ratio tends to 0 as the dimension grows. Lean · doc · headline
337	SharpCATOFilling	Cartan–Hadamard for all $\kappa \leq 0$, and rigidity. Lean · doc · headline
348	EinsteinFour	Nonnegative curvature and the L^2 gap; only strictly positive curvature is formalized. Lean · doc · headline
353	AffineBernstein	The dimension-ten sharpness example. Lean · doc · headline
356	WeakHessian	Gigli’s characterization of Alexandrov curvature. Lean · doc · headline
361	HarmonicGrowth	$\mathbb{R}^3$, and every large k ; only some even $n \geq 8$ is formalized. Lean · doc · headline
365	Conductivity	Joint recovery of a metric and a connection. Lean · doc · headline

6 Smaller observations

- **Docs that understate.**
 - Doc 087 says the nonsymmetric Mahler conjecture is not included, but **GeneralMahler** states it.

- Doc 167 says the unit-distance theorem is not included, but `PlanarUnitDistances` states it.
- Doc 129 excludes one-way liveness, then links the challenge that states it.
- **A typo.** `CONTENTS.md` line 2372 gives the hyperbolic-cone polynomial degree 16. The paper and the Lean both say 20.
- **Irregular challenge files.**
 - `HarmonicGrowth.lean` declares an `axiom` inside the challenge file. This is harmless, because the solution proves the theorem without it.
 - `ForcedNavierStokesComputation` duplicates `BalancedThreeStack`.
- **Patches.** The files in `lean/patches/` are described as compatibility patches, but several add new mathematics to upstream packages. The `PrimeNumberTheoremAnd` patch adds 47 files, including ones the Catalan proof imports. Comparator still checks this code. The patches are applied by `lake update`, not by `lake exe cache get`.

A Comparator runs

All runs used Lean v4.34.1, with Comparator and `lean4export` built for that version and the default kernel. Every run accepted the solution, using only `propext`, `Quot.sound` and `Classical.choice`.

QuasiRiemannHypothesis	DirichletSevenEighths	HeckeSevenEighths
SiegelZeros	Catalan	PiExponent
UniqueGamesTheorem	KaplanskyDirectFiniteness	SidorenkoCounterexample
EuclideanFiveColor	CirculantHadamard	MatrixMultiplication
MatrixFields	BarnetteHamiltonian	SeymourSecondNeighborhood
RyserCovering	BorsukNine	Naimark
DefocusingNLS	Brenier	KServer
OccupiedOverlap	Rokhlin	SpinAngle
ElementaryPositivity		

B The degenerate conjunct in ThorpRemaining

Write $M_r(\mu) = D_\mu \text{tr}((Q^*Q)^r)$ for the weighted moment of the challenge. The challenge defines the two properties below, which share the same M_r , b_η , H and R_κ .

SignedMain : $\forall \eta > 0 \forall \kappa \exists r \geq 1 \forall d \geq 1 \forall \mu \forall \alpha, \beta, \gamma, \quad |\alpha| + |\beta| + |\gamma| = 2^d \Rightarrow \log M_r(\mu) \leq b_\eta(d) H(\alpha, \beta) + R_\kappa(d, |\gamma|),$
UnitMoment : $\exists r \geq 1 \forall d \geq 1 \forall \mu, \quad M_r(\mu) \leq 1.$

Nothing ties μ to (α, β, γ) . Taking $\alpha = (2^d)$ and $\beta = \gamma = \emptyset$ makes the right-hand side 0, and the bounds are nonnegative in general. A Lean file that copies the challenge’s definitions proves `theorem signedMain_iff_unit` : `SignedMain` $\leftrightarrow$ `UnitMoment` against the repository’s pinned Mathlib, with no `sorry`.

C All 405 challenges

Family	Challenge	Verdict
003	DirichletSevenEighths	matches
003	HeckeSevenEighths	matches
003	QuasiRiemannHypothesis	matches
003	SiegelZeros	matches
005	Catalan	matches
007	OrdinaryElliott	matches

Family	Challenge	Verdict
007	OrdinaryTwoPointCorrelations	matches
008	DeligneDrinfeld	matches
009	BogomolovPopInjectivity	overclaim
012	JointDickman	matches
013	OstmannComplete	matches
013	OstmannPrimes	matches
015	DukePrimeDegree	overclaim
017	PiExponent	matches
020	PowerFreeValues	stronger
021	Jacobsthal	matches
021	JacobsthalImproved	matches
023	PattersonFirstMoment	matches
024	TotientAsymptotic	matches
024	TotientCompanionZero	matches
025	EgyptianFractions	matches
025	ShortEgyptianFractions	matches
026	PrimeGaps	matches
028	GaussianMoat	matches
033	LogKodairaFiberNegative	overclaim
039	MaximalSeshadriConstants	overclaim
039	Nagata	matches
047	ComplexCancellation	overclaim
049	AbhyankarSathaye	overclaim
049	CommutingDerivations	overclaim
050	QuadricBundles	matches
052	KahlerSplitting	matches
052	SplitTangentIntegrability	matches
058	SymmetricDomains	overclaim
071	KoebeCircleDomains	matches
072	Brennan	overclaim
072	BrennanSharp	matches
072	StrictMeans	matches
073	FalconerAllDimensions	matches
073	PlanarFalconer	matches
076	AsymptoticallyMinimalLittlewood	matches
076	LittlewoodFiniteFlatness	matches
081	RieszQuantitative	matches
082	TriangularHilbert	overclaim

Family	Challenge	Verdict
083	LipschitzHilbert	matches
084	DyadicAvoidance	overclaim
085	DiskMaximal	matches
085	SignedFiniteBand	matches
087	GeneralMahler	matches
087	MahlerConjecture	matches
087	SymmetricMahlerEquality	matches
087	SymmetricPolar	matches
088	PettyProjectionVolume	matches
088	ProjectionCounterexample	matches
088	ProjectionVolume	matches
089	BoundedTreewidthL1	matches
089	PlanarL1	matches
090	AtomicGaussian	matches
090	PlanarPacking	matches
090	TriangularEnergy	matches
090	TriangularGaussian	matches
091	LogBrunnMinkowski	overclaim
092	CoveringDensity	matches
092	SingleLatticeCovering	matches
094	SubpolynomialLp	matches
095	HyperbolicCones	overclaim
096	GaussianPropeller	matches
097	SteinitzBergstrom	overclaim
098	CompactBanach	matches
098	DoublingHilbert	matches
099	BinaryEditLower	matches
099	EditDistance	matches
099	FiniteCircle	matches
099	TreeEdit	matches
100	CylinderCovering	weaker
100	RuledCovering	weaker
100	TriangularCovering	matches
102	DirectedFeedback	matches
102	MinUncut	matches
102	OptimalMaxCut	matches
102	UniqueGamesTheorem	matches
102	VertexCover	matches

Family	Challenge	Verdict
104	RandomizedMeanPayoff	overclaim
104	TruffetCounterexample	matches
105	PerfectCompleteness	matches
106	IndependentSets	matches
107	MatrixFields	matches
107	MatrixMultiplication	stronger
108	PermanentCubic	matches
108	SmoothInitialForm	matches
110	KServer	matches
110	UniformKServer	matches
111	MatroidProphet	matches
111	MatroidSecretary	matches
112	DepthThree	matches
113	BinaryMatching	matches
113	MatchingEntropy	matches
113	MatchingEntropyBounds	matches
113	MatchingFPRAS	matches
113	SingletonLoopMatching	matches
113	TriangleFace	matches
114	CommonBasesFPRAS	overclaim
115	ContingencyTables	matches
116	FormulaHitting	overclaim
116	RationalHitting	matches
117	UniformSparsestCut	matches
118	BinPackingGap	matches
119	CourtadeKumar	overclaim
119	SoftChannel204	overclaim
121	EditApproximation	possible
122	TraceReconstruction	overclaim
124	ThreeMachine	matches
125	KMedianRecovery	matches
125	KMedianRefinedRecovery	matches
125	KMedianThreshold	matches
125	MetricKMedian	matches
126	MatchingAffineLift	matches
126	MatchingPSD	matches
127	GotsmanLinial	matches
128	Superstring	matches

Family	Challenge	Verdict
129	OneWayLiveness	matches
129	TwoWayComplementation	matches
129	TwoWayDeterminization	matches
130	ExactFourier	matches
131	SwitchChain	matches
132	SensitivitySeparation	unchecked overclaim
133	ParityLifts	matches
133	VariableWL	matches
133	WLIdentification	matches
133	WeisfeilerLeman	matches
134	GeneralizedStarHeight	matches
135	DepthFive	matches
139	LogConcaveQuery	matches
140	GaussianFiniteEntropy	matches
140	GaussianInformation	matches
140	GaussianReplacement	matches
140	MemoryPrecision	matches
140	NoiselessRegression	matches
140	PosteriorReplicas	matches
140	ProjectionMoments	matches
140	SubsphereCurrent	matches
143	QuinticLienard	overclaim
144	ThreeTorus	matches
145	Rokhlin	matches
146	StandardMapComponents	matches
146	StandardMapEntropy	matches
146	StandardMapLyapunov	matches
148	SelfSimilar	matches
148	SelfSimilarCorollaries	matches
149	MassAction	overclaim
150	IrrationalTriangleBilliard	overclaim
151	C1EntropyCounterexample	matches
152	SmoothObstruction	matches
155	PeriodicTilingThree	stronger
156	BorsukNine	matches
157	ListHadwiger	overclaim
158	EuclideanFiveColor	matches
158	PlaneColoring	matches

Family	Challenge	Verdict
159	ErdosReciprocal	matches
160	QuantitativeVanDerWaerden	unchecked
161	SidorenkoCounterexample	matches
162	BalancedRyser	matches
162	RyserCovering	matches
162	RyserOddExtensions	overclaim
165	BipartiteCrossing	matches
165	CompleteCrossing	matches
167	PinnedDistances	matches
167	PlanarUnitDistances	matches
168	KLInvariance	matches
169	ElementaryPositivity	weaker
170	RamseyFive	matches
170	SharpLogRamsey	matches
172	EuclideanRamsey	overclaim
172	EuclideanRamseyCircle	matches
172	EuclideanRamseyNine	matches
172	EuclideanRamseyQuadratic	matches
172	EuclideanRamseySpherical	matches
172	EuclideanRamseyTransitive	matches
172	GrahamSpherical	stronger
173	SeymourSecondNeighborhood	matches
174	AlgorithmicThinTrees	matches
174	StrongThinTree	matches
175	TalagrandDiscreteConvexity	overclaim
175	TalagrandExpectationThreshold	overclaim
176	SecondKahnKalai	matches
177	CoboundaryExpanders	matches
179	CirculantHadamard	matches
179	EvenBarker	matches
180	BarnetteHamiltonian	matches
181	CycleDecomposition	matches
182	SquareDifference	overclaim
183	HalvingLines	overclaim
184	CliqueFreeLog	matches
185	InfiniteMatroid	matches
185	InfiniteMatroidCorollaries	matches
186	SharpThreshold	overclaim

Family	Challenge	Verdict
187	SnakyCertificate	matches
187	SnakyConditional	unchecked
187	SnakyTwentyOne	matches
188	TriangleRemoval	matches
189	CycleCliqueRamsey	matches
190	MatrixRemoval	matches
191	HeilbronnTriangle	matches
192	SquareRootDegree	matches
194	DuttaDomain	matches
196	TorsionFreeZeroDivisors	matches
197	GroupRingDeterminant	overclaim
197	KaplanskyDirectFiniteness	overclaim
197	KaplanskyFinitelyPresented	overclaim
197	OddKaplansky	overclaim
198	FinitisticAsymmetry	matches
198	LittleFinitistic	matches
199	AuslanderReiten	matches
199	Tachikawa	matches
205	Saxl	matches
205	UniversalTensorSquares	matches
206	FiniteCongruenceGraph	matches
207	BassTorsionFree	matches
207	BassTrace	overclaim
210	FoulkesHowe	unchecked
211	FKCRT	overclaim
212	GammaPassage	overclaim
212	PlanarFirstPassage	overclaim
213	CriticalPercolation	matches
213	CriticalZ3	matches
214	BenjaminiSchramm	matches
214	CayleyPercolation	matches
215	ClassicalON	overclaim
218	BufferedIsing	overclaim
220	DirectionalBallisticity	matches
220	DirectionalWalk	overclaim
220	VelocityHemisphere	matches
221	DilutedSpin	matches
222	IsingFiniteness	matches

Family	Challenge	Verdict
222	PerceptronFreeEnergy	matches
222	SphericalField	matches
227	CriticalSK	matches
227	CriticalSKMixing	overclaim
227	SKBarriers	overclaim
227	SKHighTemperature	matches
227	SKRatio	matches
228	ContinuumTransition	matches
228	RadialDensityInterval	matches
228	RadialTransition	matches
229	ThreeStateSupercritical	overclaim
229	ThreeStateTreeClauses	overclaim
230	SLELowerPositivity	weaker overclaim
231	FreeUniformSpanningForest	matches
231	StronglyRayleighDPP	matches
234	InvariantIsing	matches
235	FixedClauseThreshold	overclaim
235	SATComputability	overclaim
235	SATSharpness	overclaim
235	SATVariance	overclaim
236	FreeIsing	matches
237	CriticalStripMass	matches
237	HoneycombBridgeFiniteness	matches
237	HoneycombFreeEnergy	matches
238	BinarySweep	matches
238	CoordinateSweeps	matches
238	CoordinateTrace	matches
238	FourRowPermanent	matches
238	OccupiedOverlap	matches
238	PartialPermutation	matches
238	SignedSweepMoment	matches
238	SpinAngle	matches
238	ThorpFirstReciprocal	weaker
238	ThorpRemaining	stronger
238	ThorpRouting	weaker
238	ThorpWeightedCompatibility	matches
238	WeightedSweepMoments	matches
240	CHObstruction	matches

Family	Challenge	Verdict
241	DegreeRigidity	matches
242	SingleFold	matches
243	ChoicelessPolynomialTime	matches
243	WitnessedChoice	matches
244	PartitionConsistency	matches
244	PartitionPrinciple	weaker
245	TypeSystemNormalization	matches
246	CannonGeometricAction	matches
247	PeriodicGroup	overclaim
248	ThompsonNonamenability	matches
249	EilenbergGanea	matches
250	BooneHigman	matches
250	SimpleOvergroups	matches
250	UniversalFInfinity	matches
251	Dixmier	overclaim
251	DixmierAllDiscrete	overclaim
252	TorsionFreeHyperbolic	matches
253	SimpleAmenable	matches
254	ArtinCAT0	matches
254	ArtinParabolicIntersections	matches
254	HarmonicArtin	matches
255	PolycyclicRecognition	matches
256	Kervaire	overclaim
257	HyperbolicObstruction	matches
260	CKSBondiPenrose	overclaim
261	PlanarAndersonSpectrum	overclaim
262	LiebThirring	overclaim
263	CoulombIonization	overclaim
263	CoulombRadii	overclaim
266	HadamardCubeFiber	matches
266	MUBSix	matches
267	HardSphere	overclaim
269	Laughlin	matches
269	LaughlinFock	matches
269	LaughlinGap	matches
269	LaughlinPlanar	matches
271	Heisenberg	matches
272	DimensionTenChannel	matches

Family	Challenge	Verdict
272	DimensionTenPair	matches
273	EntropyPhotonNumber	overclaim
274	QACParity	unchecked
274	RegularParity	matches
275	ContinuumCoulombHardness	matches
276	AmplitudeDamping	matches
277	EntangledGames	weaker
279	ExactQuantumFactoring	matches
280	VertexAlgebraNet	matches
281	SKFullSupport	matches
281	SKValue	matches
287	InterpolatedFactors	matches
288	KadisonSimilarity	matches
288	UniformCommutator	matches
289	StrongKadisonKastler	overclaim
290	BoundedRecovery	overclaim
291	UniformGamma	overclaim
292	NuclearUltrapower	matches
293	BackwardIntertwiners	matches
293	ContinuousCircleWeight	matches
293	FiniteFactor	matches
293	HyperinvariantSubspaces	matches
293	IrrationalRotation	matches
293	ProductBrown	matches
294	KaplanskyQuasitrace	matches
294	KaplanskyStableFiniteness	matches
295	KadisonRingrose	matches
296	FactorGeneration	matches
296	RelativeGeneration	matches
297	Naimark	matches
298	FiniteEntropySeparation	matches
299	CharacterCriterion	overclaim
303	ExactInfiniteness	overclaim
303	IndividualStrongInfiniteness	overclaim
307	CoarseAssembly	overclaim
312	GrothendieckElementaryExpansion	matches
317	ThomasonModelStructures	matches
322	TingleySphereIsometry	matches

Family	Challenge	Verdict
323	SeparableQuotientNegative	matches
324	COAbsorption	matches
324	LipschitzEquivalence	matches
325	CompleteCrouzeix	matches
325	CrouzeixHilbert	matches
325	DirectCrouzeix	matches
325	HilbertCrouzeix	matches
325	StructuralCrouzeix	matches
326	Cotype	matches
327	MarkovType	unchecked
328	ReflexiveFixedPoints	matches
329	MetricEntropyDuality	overclaim
330	DiscreteLipschitzFree	matches
330	Reall1Renorming	matches
331	BoundedTreePotentials	stronger unchecked
331	DaugavetModuli	matches
331	DiamondDistortion	matches
331	ForestSpace	unchecked
331	IndependentProducts	matches
331	MidpointLenses	unchecked
331	RecursivePotentials	matches
333	SurfaceImmersion	matches
334	IsometricImmersion	matches
337	FillingCoefficient	matches
337	SharpCAT0Filling	matches
342	TamingCompatibility	matches
343	BallPacking	matches
343	BallPackingNecessity	matches
347	ArnoldCounterexample	weaker
348	EinsteinFour	overclaim
350	NodalLength	matches
350	SmoothYau	matches
350	YauCounterexample	weaker overclaim
353	AffineBernstein	matches
354	CubicTorus	matches
356	WeakHessian	overclaim
358	ConjugatePoints	matches
359	PinchedKahler	matches

Family	Challenge	Verdict
360	BiholderTransport	matches
360	WeakMTWGlobalSupport	unchecked
361	HarmonicGrowth	overclaim
362	VlasovMaxwell	matches
363	BoltzmannNonuniqueness	matches
365	Conductivity	overclaim
367	BernoulliNonflatInSeven	matches
369	HotSpots	matches
370	HenonEmden	matches
371	DefocusingNLS	matches
372	ElasticityUniqueness	matches
373	CoulombCounterexample	matches
374	Brenier	matches
376	BalancedBoxRouting	matches
376	BalancedThreeStack	matches
376	ForcedNavierStokesComputation	matches
376	NavierStokesAlternating	matches
376	NavierStokesVelocity	matches
376	SolenoidalSheetPrograms	matches