MCP SERVER | NO CODE | CLOUD HOSTED

Fraction Exact Calculator MCP for AI Agents

Perform high-precision rational math and exact decimal expansions.

Fraction Exact Calculator performs exact rational number arithmetic, continued fraction analysis, and decimal expansion without floating-point errors. It handles fractions as perfect ratios to ensure mathematical accuracy in every calculation.

A+ Quality Score 100/100

fractions | rational-numbers | precision | arithmetic | continued-fractions | decimals

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vinkius.com/mcp/fraction-exact-calculator

SCAN TO VIEW

The connectivity layer between AI and the world's software.

Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

> *The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.*
>
> — Architecture principle

Four Pillars of the Vinkius Runtime

01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

AES-256	Ed25519	24h TTL	V8 Isolate
Encryption at rest	PKI vault signatures	Ephemeral session keys	Sandboxed execution

One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT

```
https://edge.vinkius.com/{token}/mcp
```

Claude · Cursor · VS Code · Windsurf · Grok · Gemini

Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

01 — Ed25519 PKI Vault

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

02 — V8 Isolate Sandboxing

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

06 — Honeytoken Trap System

Phantom credentials are injected into isolated environments. If a honeytoken is used outside Vinkius infrastructure, the server is quarantined instantly.

Emergency Kill Switch

EU AI Act Art. 14(1) Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

Control Plane

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

Agent Activity

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

FinOps

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

Tool Health

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

Firewall & DLP

PII redaction activity, sensitive data protection counters, and security event timeline.

Incident Log

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

> Get started at **cloud.vinkius.com** — connect your AI agent in under 60 seconds.

Fraction Exact Calculator MCP

4 tools available
Cloud-hosted on Vinkius

Standard math in most software has a hidden problem. When you try to add 0.1 and 0.2, your computer doesn't always get 0.3. It gets something slightly off because it can't represent certain decimals perfectly in binary. This MCP fixes that by doing all the heavy lifting with rational numbers. It treats every value as a fraction with a numerator and a denominator, which keeps your numbers perfectly accurate no matter how many times you perform an operation.

If you're building a financial tool where every cent matters, or a scientific model that requires absolute precision, you can't afford to let your agent guess at the math. By using this MCP, you give your agent a way to handle numbers exactly as they appear. You can take a messy string of numbers and break them down into clean components, perform complex arithmetic without losing a single digit, or see exactly how a fraction repeats in decimal form. It's a reliable way to ensure your agent doesn't round off a critical value or provide an approximate answer when you need the truth. You can find this and thousands of other tools in the Vinkius catalog to build out your specific agent setup.

Core Capabilities

01 — Perform exact arithmetic

Add, subtract, multiply, or divide fractions without any rounding errors.

02 — Parse fraction strings

Break down text like '3/4' into its numerator and denominator components.

03 — Analyze continued fractions

Identify the coefficients and convergents of a rational number.

04 — Expand to exact decimals

Convert fractions to decimals while showing repeating patterns.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/fraction-exact-calculator** — connect your AI agent in three steps.

01 Provide a fraction string or two numbers for a specific math operation.

02 The agent processes the math using integer-based numerator and denominator logic.

03 You get back a perfectly accurate result without any floating-point drift.

The bottom line is you get perfect mathematical accuracy for rational numbers.

Built For

This is for anyone who needs 100% accuracy in math. It's for people who can't afford the tiny errors that come from standard computer decimals, especially in finance, science, or high-precision coding.

Quantitative Analyst

Calculating precise interest rates or portfolio weights where every decimal point counts.

Academic Researcher

Analyzing continued fractions or complex rational sequences for mathematical papers.

Software Engineer

Building financial apps or scientific tools where floating-point errors are unacceptable.

What Changes When You Connect

01 Eliminate rounding errors: Use calculate_operation to keep numbers perfectly accurate through every step of a calculation.

02 See repeating patterns: Use expand_to_decimal to identify overline notation for repeating decimals instead of long, messy strings.

03 Parse raw data: Use parse_rational to quickly turn string inputs into clean numerator and denominator parts for your agent.

04 Deep analysis: Use analyze_continued_fraction to find coefficients for complex rational numbers in seconds.

05 Reliable results: Get consistent math across any MCP-compatible client without the risk of floating-point drift.

Real-World Applications

Precise Financial Interest

A finance pro asks for the exact interest on a loan. The agent uses calculate_operation to ensure not a single cent is lost to rounding.

Scientific Measurement

A researcher needs to convert a precise measurement into a decimal. The agent uses expand_to_decimal to show the exact repeating pattern.

Avoiding Float Bugs

A developer wants to avoid the 0.1 + 0.2 error. The agent uses parse_rational and calculate_operation to handle the math as fractions.

Math Education

A teacher wants to show students how 1/7 repeats. The agent uses expand_to_decimal to provide the exact overline notation.

Patterns to Avoid

Asking for basic float math

✗ AVOID

What is 0.1 + 0.2?

✓ INSTEAD

Ask the agent to use calculate_operation with fractions like 1/10 + 1/5 to ensure perfect accuracy.

Just getting a long decimal

✗ AVOID

What is 1/7 as a decimal?

✓ INSTEAD

Use expand_to_decimal to see the repeating pattern clearly rather than a truncated string.

Doing math in the prompt

✗ AVOID

Multiply 1/3 by 2/5 and tell me the result.

✓ INSTEAD

Tell your agent to use calculate_operation to perform the math instead of doing it in the chat.

The Right Fit

Use this MCP if you need absolute mathematical precision for rational numbers. If your work involves financial calculations, scientific measurements, or any scenario where 0.1 + 0.2 must equal 0.3, this is your go-to tool. It is specifically designed to handle fractions as perfect ratios. Don't use this if you only need approximate results for things like 3D graphics or general physics simulations where standard floating-point math is the industry standard and speed is more important than perfect precision. Use calculate_operation for arithmetic, parse_rational for input handling, and expand_to_decimal for final results.

Fraction Exact Calculator for Precision-Critical Finance

Dealing with decimals in software often leads to frustrating bugs. You might be trying to calculate a bank interest rate or a tax percentage, but the computer introduces tiny errors because it can't store certain fractions perfectly. You end up having to manually check calculations or deal with off by one errors that ruin your data.

This MCP changes that by moving the math into the rational domain. Instead of letting your agent guess at a decimal, it treats every number as a fraction. You get results that stay perfectly accurate through every step of the process.

Fraction Exact Calculator for Scientific Decimal Expansion

You no longer have to worry about rounding errors piling up in long calculations. You don't have to copy-paste values between a calculator and your agent to ensure the math is right.

Your agent now handles high-precision rational math with total confidence. You get exact answers every time.

Fraction Exact Calculator 4 Tools for Precision Math

Perform exact arithmetic, analyze continued fractions, and expand decimals without any rounding errors.

#	TOOL	DESCRIPTION
01	`analyze_continued_fraction`	Breaks a rational number into its continued fraction coefficients.
02	`calculate_operation`	Adds, subtracts, multiplies, or divides two fractions.
03	`expand_to_decimal`	Converts a fraction into a decimal and shows repeating patterns.
04	`parse_rational`	Breaks a fraction string into its numerator and denominator parts.

See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

U What is 1/3 + 1/6?

The result of 1/3 + 1/6 is **1/2**.

U Convert 3 1/2 to an improper fraction.

3 1/2 is equal to **7/2**.

U What is the decimal expansion of 1/7?

The decimal expansion of 1/7 is **0.142857...** (repeating).

Frequently Asked Questions

01 **Can the Fraction Exact Calculator handle large fractions?**

Yes. It uses integer-based logic for numerators and denominators, allowing it to handle large rational numbers without the precision loss seen in standard decimal math.

02 **Does the Fraction Exact Calculator fix 0.1 + 0.2 errors?**

Exactly. By treating these as 1/10 and 1/5, the MCP ensures the math is perfect every time, avoiding the tiny errors common in standard computing.

03 **How does Fraction Exact Calculator show repeating decimals?**

It uses expand_to_decimal to identify repeating patterns, giving you the exact decimal representation rather than a rounded approximation.

04 **Can I use Fraction Exact Calculator for financial interest rates?**

Yes, it is ideal for finance. It keeps every cent accurate by performing all calculations as fractions until you need the final decimal result.

05 **Will Fraction Exact Calculator work with my existing agent?**

Yes, it works with any MCP-compatible client like Claude, Cursor, or Windsurf to give your agent precise math capabilities.

06 **Can Fraction Exact Calculator handle complex fraction strings?**

Yes, you can provide strings like '3/4' and the agent will use parse_rational to break them down into components for calculation.

Go Live in 60 Seconds

Get your connection token from **cloud.vinkius.com**, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

```
https://edge.vinkius.com/[TOKEN]/mcp
```

CLIENT	WHERE TO CONFIGURE
Claude AI	Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint
Cursor	Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint
VS Code	Ctrl/Cmd+Shift+P → "MCP: Add Server" → add `"fraction-exact-calculator": { "url": "…" }`
Windsurf	MCP Settings → `mcp_settings.json` → Add endpoint URL
ChatGPT	Settings → Tools & plugins → Add MCP server → Paste endpoint
Gemini	Extensions → Add MCP Server → Paste endpoint URL

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

- Ask ChatGPT
- Ask Claude
- Ask Perplexity
- Ask Gemini
- Ask Grok

READY TO CONNECT

Fraction Exact Calculator is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and start building. No SDK. No deployment. Just results.

Start at cloud.vinkius.com →

vinkius.com · support@vinkius.com

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