MCP SERVER | NO CODE | CLOUD HOSTED

# Fundamental Math MCP

## Calculate numbers that can't be guessed.

Fundamental Math is a deterministic math engine that guarantees 100% accurate calculations for critical workflows. It provides local computational tools for percentages, factorials, square roots, powers, and proportional reasoning (the rule of three). Stop relying on models for precise numbers; use this MCP to embed real calculator functionality directly into your agents.

A+ Quality Score 100/100

deterministic-math | computation | precision-engine | no-hallucination | local-processing | arithmetic

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vinkius.com/mcp/fundamental-math

SCAN TO VIEW

# The infrastructure that powers AI agents in the real world.

Vinkius connects AI to the world's software through secure, enterprise-grade infrastructure — enabling real-world execution at scale, built on the Model Context Protocol (MCP).

# Your AI Connections Run Through Vinkius Cloud

The world's largest managed MCP catalog

Vinkius is the cloud infrastructure where AI agents connect 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.

# Fundamental Math MCP

5 tools available
Cloud-hosted on Vinkius

When your agent needs to crunch the actual numbers—like calculating tax percentages or figuring out probabilities—relying solely on a large language model is risky. LLMs are great at concepts, but they notoriously hallucinate when it comes to exact math. This MCP solves that by giving your AI client a deterministic computational core. You connect this via Vinkius and give your agent the power of a real calculator, every time. It runs purely locally in JavaScript, meaning no data leaves your secure environment while you get perfect results for complex ratios, factorials, or simple exponents. Instead of describing how to calculate something, you just ask, and the engine gives you the exact number.

## Core Capabilities

**01 — Determine Proportions**

Solve proportionality problems using established relationships, like finding missing variables in a rate equation.

**02 — Calculate Percentages**

Accurately determine what percentage one number represents of a larger total value.

**03 — Find Exponents and Powers**

Compute the result when a base number is raised to an assigned exponent.

**04 — Calculate Factorials**

Determine the factorial of any non-negative integer, essential for probability work.

**05 — Find Square Roots**

Compute the precise square root of a given number.

## One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/fundamental-math** — connect your AI agent in three steps.

01 You instruct your AI client to perform a specific calculation, such as finding 15% of $800.

02 The agent recognizes the need for precise data and calls the appropriate tool within this MCP, like `calculate_percentage`.

03 The engine returns a guaranteed accurate number (e.g., 120) to your client, which then incorporates it into its response.

The bottom line is that you bypass the model's conversational layer and talk directly to a reliable math processor.

## Built For

Financial analysts who can't trust LLM-generated numbers, data scientists building statistical models, or operations engineers running automated proportional checks. You need absolute mathematical certainty.

**Data Analyst**

Needs to calculate complex ratios and determine percentages from raw datasets without copy-pasting into Excel.

**Financial Modeler**

Routinely uses the MCP's calculation tools to verify expected values, like calculating required returns or future compounding rates.

**Software Engineer (Backend)**

Integrates precise math functions into code generation pipelines, using the tool to calculate factorials for probability distributions.

## What Changes When You Connect

01 Stop trusting LLM guesses. When you need a precise value, like calculating the factorial of 12, use `calculate_factorial` to get an exact number every time.

02 Handle financial reporting with confidence. Use `calculate_percentage` to accurately determine allocations and tax rates without error-prone manual steps.

03 Improve data modeling immediately. The `calculate_rule_of_three` tool lets you solve ratios—like lead generation per dollar spent—in a single prompt.

04 Maintain privacy while computing. Because the engine runs locally, sensitive financial or statistical data never leaves your secure environment.

05 Build robust scripts faster. By using tools like `calculate_power`, developers embed reliable math functions directly into their agent workflows.

## Real-World Applications

**Calculating Investment Returns**

A financial analyst needs to know the exact compounding value of an investment over several years. They ask their agent, which uses `calculate_power` to provide a guaranteed accurate final dollar figure, eliminating guesswork.

**Analyzing Campaign Efficiency**

A marketing manager wants to compare lead generation rates across three regions. Asking the agent to use `calculate_rule_of_three` gives them an immediate, mathematically verified expected output for each region's investment.

**Completing Statistical Reports**

A data scientist must calculate a required sample size for a survey. They prompt the agent to use `calculate_square_root` and receive the precise, non-hallucinated value needed to complete their report.

**Probability Scripting**

An engineer is writing code that requires calculating combinations based on a fixed set of items. They use `calculate_factorial` to get the exact number, ensuring their probability distribution script runs flawlessly.

# Patterns to Avoid

### Asking for complex math from an LLM alone

✗ AVOID

Prompting your agent: 'What is 12!?' and accepting the text response without verification.

✓ INSTEAD

Instead, instruct your agent to use the `calculate_factorial` tool. This forces the system to run a deterministic calculation engine rather than relying on language prediction.

### Manually calculating percentages in prompts

✗ AVOID

Writing: 'If 3 out of 20 items are good, what percentage is that?' and getting vague text.

✓ INSTEAD

Use the `calculate_percentage` tool. This ensures your agent gets the precise numerical output (15%) needed for downstream calculations.

### Forgetting ratios in real-world scenarios

✗ AVOID

Trying to estimate resource needs by describing a relationship: 'If 3 workers build X, how many do I need for Y?'

✓ INSTEAD

Use the `calculate_rule_of_three` tool. It takes your known rates (workers/time) and calculates the precise missing variable.

## The Right Fit

You should use this MCP when accuracy is non-negotiable. If you need to solve proportions, calculate tax brackets, or determine statistical measures like standard deviations, this tool is mandatory. It provides the deterministic calculation layer your workflows demand.

Don't use it if your primary goal is drafting content, brainstorming ideas, or summarizing qualitative text. For those tasks, a general-purpose agent works fine. If you are simply writing code and need help structuring classes or explaining concepts—those tasks don't require the `calculate_power` tool. You only need this math engine when the answer must be mathematically perfect.

## Math mistakes cost more than time does.

Today, running calculations often means a series of painful steps: you copy a number from an agent's text output, paste it into a spreadsheet, manually adjust the formula, and then copy the final result back into your report. If that formula fails or you misread a digit, the whole analysis is suspect.

With this MCP, when your agent needs to calculate something like percentage allocation, it doesn't send text; it sends a reliable data point. You get immediate, guaranteed accurate numbers without ever touching a spreadsheet.

## Getting Precise Math with the Fundamental Math MCP

You skip the copy/paste cycle entirely. Instead of asking the agent to 'calculate X,' you prompt it, and the agent executes tools like `calculate_square_root` or `calculate_factorial` directly in the background.

The result is clean: your AI client gets a perfect numerical output, ready for immediate use, making mathematical workflows fast and reliable.

# Fundamental Math: 5 Calculation Tools

These tools allow your AI client to perform deterministic arithmetic functions, ensuring perfect results for everything from ratios to exponents.

| # | TOOL | DESCRIPTION |
|---|---|---|
| 01 | `calculate_factorial` | This function calculates the factorial (n!) of any given whole number. |
| 02 | `calculate_percentage` | Use this to find out what percentage one value represents compared to a total amount. |
| 03 | `calculate_power` | It computes the result of raising one number (the base) to another number (the exponent). |
| 04 | `calculate_rule_of_three` | This solves simple proportional problems, determining a missing value based on two known rates. |
| 05 | `calculate_square_root` | It computes the positive square root of any given number. |

# See It in Action

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

**U** I have a total budget of 4500 and I want to allocate 17.5% to marketing. Calculate the exact value.

Using the calculate_percentage tool: The exact value for 17.5% of 4500 is 787.5.

**U** If an ad campaign generated 120 leads with a $500 investment, how many leads can I expect with a $2500 investment?

Using the calculate_rule_of_three tool (A=500, B=120, C=2500): You can expect exactly 600 leads with a $2500 investment.

**U** Calculate the factorial of 12 for my probability distribution script.

Using the calculate_factorial tool: The factorial of 12 (12!) is exactly 479,001,600.

# Frequently Asked Questions

01 **How does calculate_percentage improve accuracy over just asking an agent?**

It forces the agent to run a deterministic calculation engine instead of generating a number based on language patterns. This ensures 100% mathematical accuracy for financial use cases.

02 **Can I use Fundamental Math MCP to solve complex ratios?**

Yes, the `calculate_rule_of_three` tool is designed specifically for solving proportional problems (A is to B, C is to X). It handles these relationships precisely.

03 **Is using calculate_factorial safe with sensitive data?**

Yes. The MCP executes purely in local JavaScript and does not make external API calls, meaning your sensitive data never leaves your secure client environment.

04 **What is the difference between calculate_power and general math tools?**

The `calculate_power` tool handles base exponentiation (X to the Y power). It provides a reliable, dedicated function for this specific mathematical operation within your workflow.

05 **Does Fundamental Math MCP support complex statistics?**

It supports essential statistical math functions like finding square roots and calculating factorials. For broader modeling, you should pair it with specialized data analysis tools.

# 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 `"fundamental-math": { "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

# Fundamental Math 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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