MCP SERVER | NO CODE | CLOUD HOSTED

Diagonal Cut Pythagorean Calculator MCP for AI Agents

Calculating precise miter joint dimensions and frame diagonals

The Diagonal Cut Pythagorean Calculator MCP calculates exact diagonal spans, mitered edge lengths, and miter offsets for woodworkers and fabricators. It gives you the precise geometry needed to assemble frames or cabinets at any angle, ensuring perfect alignment and zero gaps every time.

A+ Quality Score 100/100

woodworking | geometry | pythagorean | miter | fabrication | precision

MAINTAINED BY VINKIUS CLOUD FOR AI AGENTS · JULY 2026
vinkius.com/mcp/diagonal-cut-pythagorean-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.

Diagonal Cut Pythagorean Calculator MCP

3 tools available
Cloud-hosted on Vinkius

Angled cuts are where most geometry calculations break down in a workshop. Trying to measure complex joints—like diagonals or miters—often requires jumping between multiple books or unreliable calculators. This MCP solves that problem. It provides immediate answers for the toughest measurements, letting your AI client handle the math instantly.

Whether you're figuring out the straight-line distance across a rectangular frame section, determining the actual length of a saw cut face at an angle, or calculating the difference between the long point and short point of a miter joint, this MCP handles it. It’s built for true precision in carpentry and fabrication.

Accessing these calculations through Vinkius means you connect once to your preferred AI client, gaining access to thousands of specialized tools, including this essential geometric suite. You stop worrying about Pythagoras' theorem and start building.

Core Capabilities

01 — Determine corner span

Finds the precise straight-line distance between opposite corners of any rectangular frame section.

02 — Measure angled cut path

Calculates the true length of a saw blade as it cuts through material at an angle.

03 — Calculate miter point difference

Determines the exact reduction or increase in length between the long and short points of a miter cut.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/diagonal-cut-pythagorean-calculator** — connect your AI agent in three steps.

01 Tell your AI client what you're working with. Provide measurements like side lengths, angles, or board widths.

02 The MCP runs the specific geometric calculation required—like finding a diagonal span or measuring an offset—using the appropriate tool.

03 You receive a clear, accurate measurement that tells you exactly what length or distance to use for your cut.

The bottom line is that instead of manual math and guesswork, you get precise, actionable dimensions instantly.

Built For

This MCP is built for professionals whose livelihood depends on accuracy: cabinet makers who build intricate joints, carpenters framing structural elements, and furniture builders creating complex angles. If your job requires joining wood or materials precisely, you need this.

Cabinet Maker

Needs to calculate the exact miter offset for cabinet doors or drawers so they join flush without gaps.

Carpenter

Uses this when framing walls or structures, needing to know the true diagonal span between corner brackets.

Furniture Builder

Requires accurate mitered edge lengths for decorative trim and joints that must fit together perfectly at angles.

What Changes When You Connect

01 Stop wasting time double-checking calculations. With the `calculate_diagonal_span` tool, your agent instantly gives you the straight-line distance across any rectangular frame section.

02 Never worry about gap fillers again. Using `calculate_miter_offset` determines exactly how much a miter point shrinks or expands at an angle, ensuring perfect joint fit.

03 Know the real path length of your cut. The `calculate_mitered_edge_length` tool finds the actual saw blade travel distance through material at any given angle.

04 Saves materials and time on site. Instead of marking up blueprints with complex geometry formulas, you simply ask your agent for the precise measurement.

05 Reduces returns and rework. By verifying dimensions before cutting, you guarantee that all components fit together perfectly during assembly.

Real-World Applications

Aligning Corner Frames

A carpenter needs to build a rectangular photo frame but the wood isn't square. He asks his agent for the diagonal span given two side measurements, getting an immediate answer he can trust.

Complex Cabinet Jointing

A cabinet maker is building interlocking corners. The agent uses `calculate_miter_offset` to confirm the exact size difference between the long and short points of the miter joint, preventing a noticeable gap.

Angled Trim Installation

A furniture builder needs trim pieces cut at a steep angle. The agent uses `calculate_mitered_edge_length` to figure out the true length of the saw path, ensuring the piece is long enough without being oversized.

Verifying Structural Stability

An architect's assistant uses the MCP to check if a structural element's corner measurements are mathematically consistent by calculating the diagonal span against known dimensions.

Patterns to Avoid

Forgetting the angled cut path

✗ AVOID

Manually measuring the length of an angled trim piece using only the width dimension, leading to a piece that is too short and leaves a visible gap.

✓ INSTEAD

Use `calculate_mitered_edge_length`. This tool finds the actual surface distance the saw travels through material at any angle, giving you the correct required length.

Ignoring miter point variances

✗ AVOID

Assuming that all miters are simply shortened by a fixed percentage. This ignores how the long and short points differ depending on board width.

✓ INSTEAD

Run `calculate_miter_offset`. It specifically measures the difference between the long and short points, giving you precise geometry for perfect joints.

Using incorrect corner measurements

✗ AVOID

Building a frame by measuring only two adjacent sides and incorrectly calculating the diagonal span without considering the overall rectangle dimensions.

✓ INSTEAD

The `calculate_diagonal_span` tool takes the full opposing dimensions, providing the mathematically accurate straight-line distance between opposite corners.

The Right Fit

Use this MCP if your work involves joining wood or materials at angles and you need precise geometric measurements—specifically diagonals, miter offsets, or true cut lengths. If you're doing simple square cuts (90 degrees) or just measuring linear distances that don't change with angle, you don't need it. Don't use this if your primary need is inventory tracking; for that, a database connection MCP works better. You need the depth of geometric knowledge that only these calculation tools provide.

Using Diagonal Cut Pythagorean Calculator for Woodworking Geometry

When you're building custom furniture or framing, the math gets complicated fast. One minute you're checking a simple right angle, and the next you need to know how much an angled joint will shrink compared to its full length. You end up switching between geometry charts, imperial rulers, and square-edge tools, constantly double-checking measurements that could ruin hours of work.

With this MCP, your agent handles the complex math instantly. Instead of measuring angles and calculating offsets by hand, you just ask for the measurement. The result is a single, accurate number—the dimension you can trust to make your cuts perfect.

Diagonal Cut Pythagorean Calculator: Precision in Fabrication Angles

Before this MCP, calculating the true path length of a saw blade on an angled board was guesswork. You'd measure the material width and then have to mentally project that measurement along the cut line—a process prone to error.

Now, you just tell your agent the dimensions, and it calculates the exact mitered edge length. That number is what you use for your saw setting. It removes the need for physical workarounds or second-guessing complex joinery.

Diagonal Cut Pythagorean Calculator: 3 Geometry Tools for Woodworking

These tools let you find the exact measurements needed for corner spans, miter offsets, and true angled cut lengths in your fabrication projects.

#	TOOL	DESCRIPTION
01	`calculate_miter_offset`	Finds the difference in length between a cut's long point and short point when cutting at an angle.
02	`calculate_mitered_edge_length`	Determines the actual length of the saw cut face when material is being cut through at an angle.
03	`calculate_diagonal_span`	Calculates the straight-line distance between two opposite corners of a rectangular section.

See It in Action

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

U I need to build a rectangular sign frame that's 36 inches wide and 24 inches high. What is the diagonal length I should cut?

Frame Diagonal Calculation

For a rectangle measuring 36 in by 24 in, the straight-line distance between opposite corners is:

- **Diagonal Span: 43.27 inches**

You'll need to cut all four corner pieces using this measurement for maximum stability.

U I have a 10-inch wide piece and I'm cutting it at a 25-degree angle for a cabinet joint. What will the saw blade length be?

Angled Cut Face Length

For a 10-inch board cut at 25 degrees, the actual path of the saw blade is approximately **13.05 inches**.

Tip: Use this figure for your guide rail to ensure the material length is accurate.

U What's the difference between the long point and short point if I use a 2-inch board at a 30 degree angle?

Miter Offset Calculation

For a 2-inch board cut at 30 degrees, the length difference (offset) is:

- **Long Point:** 2.31 inches
- **Short Point:** 1.89 inches
- **Offset Difference: 0.42 inches**

This offset tells you exactly how much shorter one point will be compared to the other.

Frequently Asked Questions

01 **How do I calculate the diagonal length for a picture frame using this MCP?**

You provide the width and height of the frame, and the calculator gives you the exact straight-line distance across opposing corners. This ensures your frames are perfectly square and stable.

02 **Does Diagonal Cut Pythagorean Calculator help with angled cabinet joints?**

Yes. It provides crucial measurements like miter offsets, letting you know exactly how much the long point differs from the short point for a perfect flush fit on your cabinets.

03 **What if I need to know the true length of my saw cut through angled material?**

You use the mitered edge length tool. This calculation accounts for the angle, telling you the actual path the saw travels and preventing your pieces from being too short.

04 **Is this MCP useful for general carpentry tasks besides picture frames?**

Absolutely. It handles any geometric need in fabrication, including structural diagonals and complex miter offsets, making it a central tool for accurate joinery across all wood types.

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 `"diagonal-cut-pythagorean-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

Diagonal Cut Pythagorean 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 →

INDEPENDENT PLATFORM DISCLAIMER

DOCUMENT INFORMATION

Generated	July 2026
MCP Server	Diagonal Cut Pythagorean Calculator MCP
Server ID	`019f250f-c707-70d5-9d71-c2f678e9d5fd`
Platform	Vinkius Cloud for AI Agents
Endpoint	`https://edge.vinkius.com/{token}/mcp`

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