Test 1 Title

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1 LaTeX Math in Markdown

This document demonstrates how to use LaTeX math equations in Markdown.

1.1 Inline Math Equations

You can include inline equations like this: $E = mc^2$ or (F = ma) within your text.

1.2 Display Math Equations

For standalone equations, use double dollar signs:

$$\int_a^b f(x)\,dx = F(b) - F(a)$$

Or use the equation environment:

$$\frac{d}{dx}\left(\int_a^x f(t)\,dt\right) = f(x) \tag{1}$$

1.3 Matrix Example

$$\begin{pmatrix} a & b \\ c & d \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} ax + by \\ cx + dy \end{pmatrix}$$

1.4   Aligned Equations
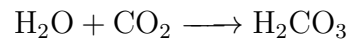
$$a = b + c \tag{2}$$
$$= d + e + f \tag{3}$$
$$= g + h \tag{4}$$

1.5   Fractions and Summations

$$\sum_{i=1}^{n} \frac{1}{i^2} = \frac{\pi^2}{6}$$

1.6   Chemical Equations

If you have the mhchem package included:

$$H_2O + CO_2 \longrightarrow H_2CO_3$$

1.7   Greek Letters

Alpha: α, Beta: β, Gamma: γ, Delta: δ, Epsilon: ϵ

1.8   Theorem Environment

Theorem 1. *For a right triangle with sides a, b and hypotenuse c:*
$$a^2 + b^2 = c^2$$

1.9   Proof Environment

Proof. This is a proof of the Pythagorean theorem. □

2   Regular Markdown Features

- Bullet points

- Work normally

1. Numbered lists

2. Also work

Bold text and *italic text* are supported.

> Blockquotes work as expected.

Tables work too:

Column 1	Column 2	Column 3
Cell 1	Cell 2	Cell 3
Cell 4	Cell 5	Cell 6

Code blocks are supported:

3 Code Examples in Different Programming Languages

3.1 Python

Python is known for its simplicity and readability. Below is a basic "Hello, World!" example:

```
print("Hello, World!")
```

JavaScript is a versatile language used for web development. Here's a function example:

3.2 JavaScript

```
function greet() {
  console.log("Hello, World!");
}
greet();
```

Java's object-oriented approach is fundamental in enterprise environments. A simple Java program:

3.3 Java

```java
public class HelloWorld {
  public static void main(String[] args) {
    System.out.println("Hello, World!");
  }
}
```

C++ offers high performance and is used in system programming. A basic C++ example:

3.4 C++

```cpp
#include <iostream>
int main() {
  std::cout << "Hello, World!" << std::endl;
  return 0;
}
```

Ruby emphasizes simplicity and productivity. A Ruby script looks like this:

3.5 Ruby

```ruby
puts "Hello, World!"
```

Go (Golang) is designed for efficient concurrency. Here's a simple Go program:

3.6 Go

```go
package main
import "fmt"
func main() {
  fmt.Println("Hello, World!")
}
```

PHP is widely used for server-side web development. A basic PHP script:

3.7 PHP

```php
<?php
echo "Hello, World!";
?>
```

Swift is Apple's language for iOS/macOS development. A Swift example:

3.8 Swift

```
print("Hello, World!")
```

Kotlin is a modern language for Android development, interoperable with Java. Example:

3.9 Kotlin

```
fun main() {
  println("Hello, World!")
}
```

Rust focuses on memory safety without sacrificing performance. A Rust example:

3.10 Rust

```
fn main() {
  println!("Hello, World!");
}
```