

Introduction

The **Settings** and trigonometric functions enhance the functionality of your calculator app, allowing users to customize the app's appearance and perform scientific calculations involving angles and trigonometric ratios.

Key Features:

1. **Settings Menu:** Change the app's menu color for a personalized experience.
 2. **Trigonometric Functions:** Compute sine (**sin**), cosine (**cos**), and tangent (**tan**) values for advanced mathematical calculations.
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Using the Settings Feature

How It Works

The **Settings Menu** allows you to change the app's menu color between **blue** and **purple** for better customization.

Steps

1. Open the calculator app.
2. Tap the **Settings** button to open the menu.
3. The app displays a dialog with an option to change the menu color:
 - If the current color is **blue**, the option will say: "**Change Menu Color to Purple.**"
 - If the current color is **purple**, the option will say: "**Change Menu Color to Blue.**"
4. Tap the button to change the color. The dialog closes, and the menu color updates.

Example

- **Scenario:** The current menu color is **blue**.
 - Tap **Settings** → Tap "**Change Menu Color to Purple**" → The menu color changes to **purple**.

Using the Trigonometric Functions

How They Work

The trigonometric buttons (**sin**, **cos**, and **tan**) allow you to append the corresponding function to your current input for calculations.

- **sin(x)**: Computes the sine of an angle xxx (in radians).
- **cos(x)**: Computes the cosine of an angle xxx.
- **tan(x)**: Computes the tangent of an angle xxx.

Steps

1. Open the calculator app.
2. Enter a number (angle in radians).
3. Tap one of the trigonometric buttons (**sin**, **cos**, or **tan**). This appends the function to your input.
4. Tap the = button to calculate.

Examples

1. **Calculating sine:**
 - Input: **sin(1)** → Tap = → Result: **0.841471**.
2. **Calculating cosine:**
 - Input: **cos(0)** → Tap = → Result: **1.0**.
3. **Calculating tangent:**
 - Input: **tan($\pi/4$)** → Tap = → Result: **1.0**.

Error Handling

Settings Feature

- **Invalid Action:** If the settings dialog is closed without selecting an option, the menu color remains unchanged.

Trigonometric Functions

1. **Invalid Input:**
 - If the input is incomplete or nonsensical (e.g., **tan()**), the app displays:
 - **Question:** Retains the invalid input.
 - **Answer:** Displays "**Error**".
2. **Domain Errors:**
 - **tan(x)** is undefined at certain points (e.g., $x=\pi/2, 3\pi/2, \dots$ $x = \frac{\pi}{2}, \frac{3\pi}{2}, \dots$).
 - For invalid inputs, the app displays:
 - **Question:** Retains the invalid input (e.g., **tan($\pi/2$)**).
 - **Answer:** Displays "**Error**".

Tips for Usage

1. **Trigonometric Functions:**

- Ensure input is in radians. For degrees, convert manually (e.g., $x \times \pi \times \frac{180}{\pi}$).
 - Avoid domain errors by ensuring valid input for **tan(x)**.
2. **Settings Menu:**
- To quickly toggle colors, use the **Settings** button without additional input.