# Composition Waves and Implicit Trig Patterns

*Drawing Mathematics with Desmos* | Justin Skycak

**Setup.** Navigate to https://www.desmos.com/calculator. Be sure to sign in so that you can save your graph.

**Demonstration - Composition Waves.** Observe the graph as you type each of the following inputs.

$$y = \sin(x)$$

$$y = \sin(x^2)$$

$$y = \sin\left(\tfrac{1}{x}\right)$$

$$y = \sin\left(\tan(x)\right)$$

$$y = \tan\left(\sin(x)\right)$$

**Demonstration - Implicit Trig Patterns.** Observe the graph as you type each of the following inputs.

$$\sin(y) = \cos(x)$$

$$\sin(y) = \tan(x)$$

$$\sin(y) = \sin(x+y)$$

$$\sin(y)\tan(x) = \cos(x)\tan(y)$$

$$\sin(y)\cos(x) = 0.1$$

$$\sin(xy) = \sin(x+y)$$

***Challenge***. Create some interesting wallpapers using implicit trig patterns!