

Directions: Beginning in cell number 1, calculate either the first or second derivative as indicated. To advance in the circuit, locate your answer and call that cell number 2. Continue in this manner until you complete the circuit.

NOTE: Attach additional pages as necessary to clearly communicate the calculus.

<p>Answer: <math>2 \sin(4x - 6)</math>            # <u>  1  </u> For <math>y = x^2 + \cos x</math> ... find <math>y'</math>.</p>	<p>Answer: <math>\frac{\cos \sqrt{x}}{2\sqrt{x}}</math>            # _____ Find the second derivative for <math>y = \tan x</math>.</p>
<p>Answer: <math>\frac{\sec^2 \frac{x}{2}}{2}</math>            # _____ Find the instantaneous rate of change for <math>y = (2 + \cos x)^3</math></p>	<p>Answer: <math>\frac{2x}{\sin x} - x^2 \cot x \csc x</math>            # _____ Calculate <math>y''</math> for <math>y = x^3 + \sin x</math>.</p>
<p>Answer: <math>\frac{\cos x}{2\sqrt{\sin x}}</math>            # _____ If <math>f(x) = \sin \sqrt{x}</math>, find <math>f'(x)</math>.</p>	<p>Answer: <math>-\sin x</math>            # _____ If <math>y = \sqrt{\sin x}</math>, then <math>y' = \dots</math></p>
<p>Answer: <math>2x - \sin x</math>            # _____ For the function <math>f(x) = x^2 \cos x</math>, find <math>f'(x)</math>.</p>	<p>Answer: <math>6x - \sin x</math>            # _____ For <math>y = \cos(x^2)</math>, find <math>\frac{dy}{dx}</math>.</p>

<p>Answer: <math>x(-x\sin x + 2\cos x)</math>  # _____ Calculate the first derivative for <math>y = x^3 - \sin x</math>.</p>	<p>Answer: <math>\frac{\sin x \cos x}{\sqrt{1 + \sin^2 x}}</math>  # _____ For <math>y = 2 + \cos^3 x</math>, <math>\frac{dy}{dx} =</math></p>
<p>Answer: <math>-3 \sin x \cos^2 x</math>  # _____ For the function <math>f(x) = \sin^2(2x - 3)</math>, find <math>f'(x)</math>.</p>	<p>Answer: <math>2\sec^2 x \tan x</math>  # _____ Find <math>\frac{dy}{dx}</math> for <math>y = \tan \frac{x}{2}</math>.</p>
<p>Answer: <math>-3 \sin x(2 + \cos x)^2</math>  # _____ Given that <math>y = \sin^3 x \tan 3x</math>, find <math>y'</math>.</p>	<p>Answer: <math>3x^2 - \cos x</math>  # _____ Find <math>y'</math> for <math>y = \frac{x^2}{\sin x}</math>.</p>
<p>Answer: <math>-2x\sin(x^2)</math>  # _____ <math>\frac{d^2}{dx^2} [\cos x \tan x] =</math></p>	<p>Answer: <math>3\sin^3 x \sec^2 3x + 3\sin^2 x \cos x \tan 3x</math>  # _____ <math>y = \sqrt{1 + \sin^2 x}</math>; <math>\frac{dy}{dx} = ?</math></p>