

DIGITLE – AB CALCULUS

Puzzle 106 – Trig Derivatives

Directions: The first 5 problems have single digit answers. The 6th problem has a 5-digit answer (counting leading zeros if present). You have a choice: solve the easier single-digit answer problems or tackle the more difficult 5-digit answer. You may use graphing calculator features on indicated problems. Once you have done that, attempt to solve the puzzle by entering the following url on your computer, tablet, or phone:

<https://mastermathmentor.com/mmm/digitle.ashx>.

The correct puzzle answer will be the digits of your answer(s) scrambled. Use the following interpretation. You get 6 tries.



Green : the digit is in the answer and is in the correct spot.
Yellow: the digit is in the answer but is not in the correct spot.

Grey : the digit is not in the answer.

Single Digit Answers:

1. If $f(x) = 12 \left(\frac{4 - \cos x}{2 + \sin x} \right)$, find $f' \left(\frac{\pi}{2} \right)$.

2) (Calculator) For how many values of x in the interval $\left[-\frac{\pi}{2}, 0 \right]$ does $\frac{d}{dx} [\sec x] = \frac{d}{dx} [-\csc x]$?

3) If $f(x) = -x \tan^2 x$, find $f' \left(\frac{3\pi}{4} \right)$ to the nearest integer.

4) If $y = \frac{\sin^2(3x)}{2}$, find $f'' \left(\frac{\pi}{3} \right)$.

5) Let $f(1) = \frac{\pi}{6}$ and $f'(1) = \sqrt{3}$, If $h(x)$ is the line tangent to $g(x) = 2 \sin(f(x)) - 1$ at $x = 1$. Find $h(2)$.

5-Digit Answer:

6) The 16th derivative of $f(x) = \cos 2x + \frac{1}{2} \sin \left(2x + \frac{\pi}{2} \right)$ at $x = \pi$ is equal to