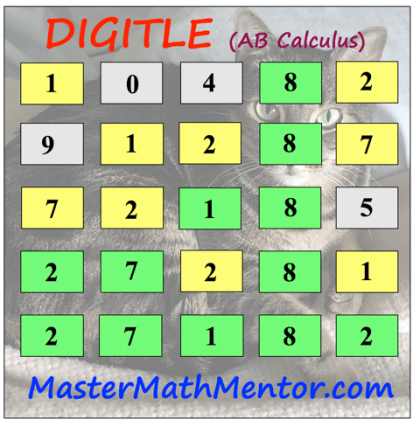
DIGITLE – AB CALCULUS
Puzzle 107 – Implicit Differentiation



Directions: The first 5 problems have single digits 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. 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 $x^2 - y^2 + y = 4$ and $y > 0$, find $\frac{dy}{dx}$ at $x = 2$.

2) For $y - \sqrt{xy} = \frac{3}{2}x^2$ at $(2,8)$, find $\frac{dy}{dx}$ to the nearest integer.

3) Find the slope to the graph of $y\cos\pi x + y^2 = 2$ at the point (0, 1).

4) If $\sqrt{x+4} - \sqrt{y+2} = a^2$, where a is a non-zero constant, find $\lim_{x\to\infty} \frac{dy}{dx}$.

5) If $\sin 4y = 8x + 6y$, what is the difference between the smallest and largest slope to the curve to the nearest integer?

5-Digit Answer:

6) The graph of $\sin(xy) = \frac{1}{2}$ passes through the point $\left(\frac{\pi}{6}, 5401\right)$. Find the value of $\frac{d^2y}{dx^2}$ at this point.