

DIGITLE – AB CALCULUS

Puzzle 117 – L'Hospital's Rule

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. 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.

Grey : the digit is not in the answer.

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

For all problems: Use an answer of 9 if you believe answer is undefined.

Single Digit Answers:

1) Find $\lim_{x \rightarrow \infty} \left(\frac{3x + 2 \ln x^2}{x} \right)$

2) Find $\lim_{x \rightarrow 0} \frac{(5x)^2}{\tan^{-1}(5x^2)}$

3) Find $\lim_{x \rightarrow 1} \frac{x^9 - 9x + 8}{x^4 - 4x + 3}$

4) Find $\lim_{x \rightarrow 0} \left(\frac{4x - \sin 4x}{4x \sin 4x} \right)$

5) Find $\lim_{x \rightarrow 0} \frac{1 - \cos^2 x}{(e^x - 1)^2}$

5-Digit Answer:

6) Find $\lim_{x \rightarrow 0} \left[\left(\frac{\sin 25x}{\sin 0.2x} \right)^2 + \left(\frac{\sin 0.2x}{\sin \frac{1}{25}x} \right) \right]$