

DIGITLE – AB CALCULUS

Puzzle 129 – Volume



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>.

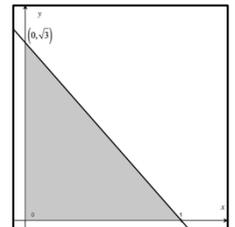
The correct puzzle answer will be the digits of your answer(s) scrambled. Use the following interpretation. You get 6 tries.

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

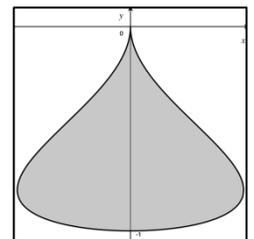
Grey : the digit is not in the answer.

Single Digit Answers:

- 1) If the region bounded by $y = 2x, y = 0, x = 3$ is rotated about first, the x -axis and second, the y -axis, the difference between the volumes is expressed as $k\pi$. Find the value of k to the nearest integer.
- 2) The volume of the solid generated by revolving the first quadrant region of $f(x) = 1 - 2x$ about the x -axis is less than 1. To one-decimal place, it can be expressed as $0.k$. Find the value of k . (For instance, if the value was 0.93, then $k = 9$).
- 3) Let R be the region bounded by the graphs of $y = |0.5x|$ and the line $y = 1$. R is the base of a solid with cross sections perpendicular to the y -axis as squares. Find the volume of the solid to the nearest integer.
- 4) As shown in the figure to the right, the shaded region is bordered by the x - and y -axes and the line with y -intercept $(0, \sqrt{3})$ and x -intercept $(1, 0)$. This region is rotated about the x -axis. If the answer is $k\pi$, find the value of k rounded to the nearest integer.



- 5) A Hershey Kiss is created by rotating the curve $x = 3y^2\sqrt{y+1}$ about the y -axis as shown by the figure to the right. Find the volume of the Hershey Kiss to the nearest integer.



5-Digit Answer:

- 6) The shaded region R in the figure to the right is the area between $f(x) = x$ and the x -axis on $[0, 300]$. The line $x = c$ divides R into two equal areas. The line $x = k$ divides the solid created when R is rotated about the x -axis into two equal volumes. Find the product of c and k rounded to the nearest integer.

