

DIGITLE – SAT/ACT

Puzzle 513 – Radicals and Rational Exponents

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) Solve the following equation for k . $\frac{1}{a^{k/9}} = \frac{1}{a^{2/3}}, a \neq 0$,

$$xy = \sqrt[3]{81}$$

2) Given the system of equations, $\frac{x}{y} = \left(\frac{1}{9}\right)^{1/3}$, find the positive value of y .

3) If $p(x) = f(x) + k$, $f(x) = \sqrt{3x+1}$ and $p(5) = 13$, find k

4) Solve the equation for x : $\sqrt[3]{a^{x+1}} = \sqrt{a^{4-x}}$

5) What is the product of the solutions to the equation $\sqrt{3x+1} + \sqrt{5x+4} = \sqrt{16x+9}$?

5-Digit Answer:

6) This problem has two parts where you solve for a and solve for b . The final solution is a (a 3-digit number) and b (a 2-digit number) written consecutively. For instance, if $a = 192$ and $b = 8$, the solution is 19208.

$$\sqrt{a+2} - \sqrt{a-7} = 1$$

$$\frac{\sqrt{x+12}}{\sqrt{x-5}} = \frac{9}{8}$$