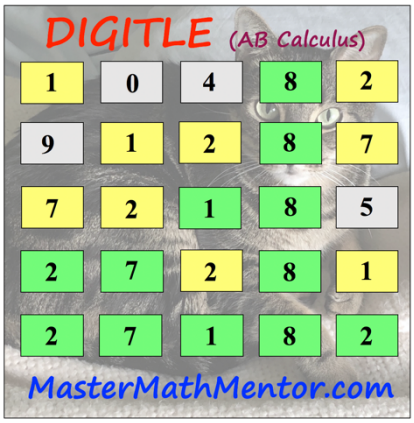
DIGITLE – SAT/ACT
Puzzle 506 – Systems of Equations



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) You are given the following system of equations: $\begin{aligned} y &= \frac{2}{3}x - 1 \\ 3x + y &= 21 \end{aligned}$. If the point of intersection is (x, y), find $x - y$.

2) Given the following system of equations, how many points of intersections are there when graphed?

$$\begin{aligned} y - 1 &= (x-2)^2 \\ y + 3 &= 0 \end{aligned}.$$

3) Find the sum of the x-values of the points of intersections of the following two equations.

$$\begin{aligned} y &= -x^2 + 10x - 1 \\ y &= 3x^2 - 6x - 10 \end{aligned}$$

4) If the following system of equations have no solutions, what is the value of $\frac{b}{a}$?

$$\begin{aligned} ax - by &= -2 \\ -\frac{1}{2}x + 3y &= 3 \end{aligned}$$

5) If the following system of equations are graphed, what is the area of the enclosed figure?

$$\begin{aligned} 2y - x &= 2 \\ x + 2y &= 2 \\ 3y &= 0 \end{aligned}$$

5-Digit Answer:

6) The following system of equations has possible intersection points $(a_1, b_1), (a_2, b_2), \ldots$

Find $(a_1 \cdot a_2 \cdot \ldots)(b_1 \cdot b_2 \cdot \ldots)$. $\begin{aligned} y &= 2x^2 - 4x - 64 \\ 6x + y + 4 &= 0 \end{aligned}$.