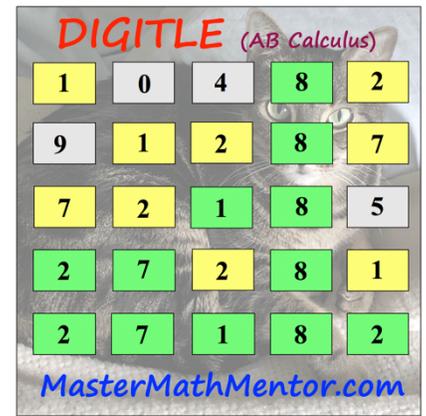


# DIGITLE – SAT/ACT

## Puzzle 512 – Interpretation of Graphs



**Directions:** The first 5 problems have single digits answers. The 6<sup>th</sup> 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>.

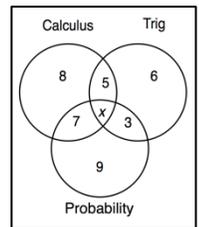
The correct puzzle answer will be the digits of your answer(s) scrambled. Use the following interpretation. You get 6 tries.

**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.

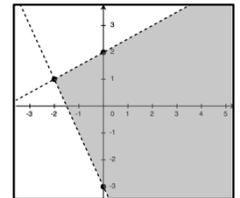
**Grey :** the digit is not in the answer.

### Single Digit Answers:

1) In the Venn diagram to the right, the circle represent students in a school taking calculus, trigonometry and/or probability. Let  $a$  be the students taking both calculus and probability. Let  $b$  be the students taking both calculus and trig. Let  $c$  be the students *only* taking probability and trig. If  $a + b - c = 25$ , find how many students are taking all 3 courses.

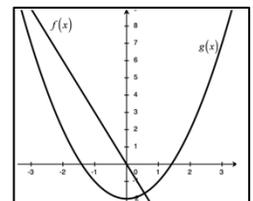


2) The shaded region in the figure to the right is enclosed by two linear inequalities in the form:  $y < m_1x + C_1$  and  $y > m_2x + C_2$ . What is the value of  $|m_1m_2|$ .



3) A parabola  $f(x)$  has vertex  $(-2, -3)$  and passes through  $(0, 5)$ . Find  $f(-5) - f(1)$ .

4) The graphs of linear function  $f(x)$  and quadratic function  $g(x)$  are both shown in the figure to the right. Find  $g(f(-1))$ .



5) A statistician examined the heights of numerous students at a school and found the line of best fit that describes the relationship between age and height (inches) is  $\text{height} = 0.75\text{age} + 61.25$ . Five random students were selected with data points  $(11, 63)$ ,  $(13, 77)$ ,  $(15, 79.5)$ ,  $(17, 71)$  and  $(14, 71.25)$ . Find the difference between the maximum and minimum discrepancy between the height of these students and their projected height by using the line of best fit.

### 5-Digit Answer:

6) The number of mutations of a virus in a laboratory is defined by an exponential equation as a function of time as shown by the figure to the right. There are 500 virus cells initially and in 3 days, there are 13,500 cells. What is the number of virus cells after 4.5 day (rounded to the nearest integer).

