

# DIGITLE – SAT/ACT

## Puzzle 511 – Polynomial Factors / 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.



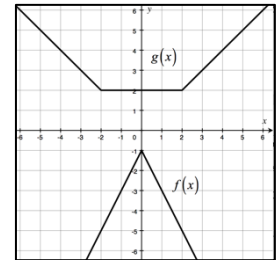
**Green :** the digit is in the answer and is in the correct spot.  
**Yellow:** the digit is in the answer but is not in the correct spot.

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

### Single Digit Answers:

- 1) If  $c$  and  $d$  are positive integers and  $c^2 - d^2 = 15$ , what is the smallest possible value for  $c$ ?
- 2) The slope of the linear function  $p(x)$  is  $\frac{3}{5}$ . Let  $h(x) = p(x-2) - 9$ . What is the  $y$ -intercept of  $h(x)$  if  $h(x)$  passes through the point  $(5, 3)$ ?

- 3) The graphs of  $f(x)$  and  $g(x)$  are shown in the figure to the right. If  $f(2) = k$ , find the value of  $g(k)$ .



- 4) If  $h(x) = \frac{x^3 - 4x^2 + x + 8}{x - 3}$  is expressed in the form  $Ax^2 + Bx + C + \frac{R}{x - 3}$ , find the value of  $R$ .
- 5) Find the average of the solutions to the following.  $-16x - 9x^2 = -x^3 - 144$ .

### 5-Digit Answer:

- 6) A lawyer's fees  $C$  are determined by time  $t$  (the number of hours the lawyer works on the case). A partial graph showing a small number of hours and the resulting cost is to the right. Using the relationship shown in the graph, 100 hours of time would result in what cost to the client?

