

MATH MAVEN'S MYSTERIES

Name: _____

Date: _____

The Case of the Phantom Number Cruncher

Hi, Math Detectives! In all my Math Maven days, I have never run across a villain as rotten as the Phantom Number Cruncher! No number is safe from his evil clutches.

In the town of Gallatin, Tennessee, a mysterious phenomenon involving the town's numbers took place. From shop signs to airport monitors, numbers were disappearing -- then reappearing as different numbers! You can imagine how much confusion this caused for the people of Gallatin. The "3 Scoops Ice Cream Shop" had turned into the "7 Scoops Ice Cream Shop." Route 20 suddenly became Route 58. Oddly, however, the price of hot dogs remained at \$1!

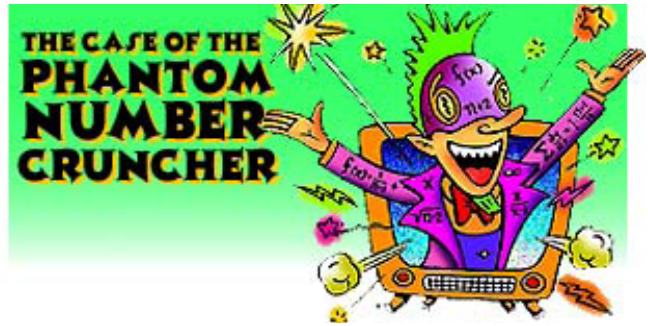
Baffled, the chief of police broadcast a special TV report asking the citizens to be on the lookout for the Phantom Number Cruncher:

"Citizens of Gallatin: If anyone has any information that can help us catch the Phantom Number Cruncher, please call the number on your screen."

The phone number "354-8217" flashed on the screen. No sooner did the numbers appear on the screen when the numbers flickered and reappeared as "7 13 10 - 22 4 1 19." Moments later, static distorted the TV picture, and replacing the chief of police was none other than the Phantom himself!

The Phantom was a sight to behold, with his shock of green hair and wacky number mask. He leaned forward and sneered, "Oh yes, dear citizens! I've taken all your numbers and changed them with my special Presto Function Changer!" At this, he tossed back his head and let loose a crazy, high-pitched laugh.

"You poor, pathetic numerical nincompoops," he continued. "The only way you'll get your numbers



Notes:

MATH MAVEN'S MYSTERIES

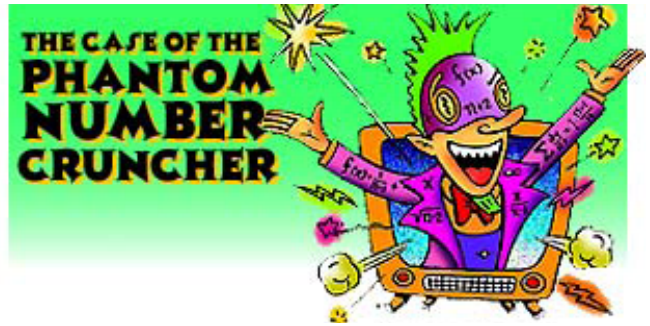
Name: _____

Date: _____

The Case of the Phantom Number Cruncher

back is if you can figure out the FUNCTIONS that changed them!" Static filled the screen, and we were returned to the exasperated police chief.

"We will get our numbers back, I promise!" thundered the chief. "Math Maven, if you and your talented math detectives are watching this broadcast, on behalf of the town of Gallatin, we need you! Help us get our numbers back and put the Phantom Number Cruncher in his place!"



Notes:



Name: _____

Date: _____

Solve the Mystery!

OK, Math Superstars! We can help the police chief crack the code of that Presto Function Changer. We just need to find the FUNCTION the Phantom is using to change the town's numbers. First, we need to understand what a function is:

A function is an expression that involves either adding, subtracting, multiplying, or dividing any given number. I'll represent that number with the letter n . An example of a simple function with the number n would be $n+3$.

Some functions can involve all four operations or combinations of operations. For example, another function with the number n may be $2n+1$. To see how this works, let's substitute 2 for n . We now have $2(2)+1$, or $4+1$, or 5. That means if the Phantom Number Cruncher was using the function $2n+1$, every 2 in town would become a 5!

Now we know how to change numbers using a given function. But our job is going to be a bit trickier, because we have to use the old numbers and the new numbers to find the function that changed them!

Which of the following functions is that tricky Phantom using to change all the numbers in town? (Hint: n represents the original numbers.)

- A. $(2n + 2) / 5$
- B. $(n + 2) - 1$
- C. $4 + 2n$
- D. $3n - 2$

Use this space to show your work: