

## MATH 5: THANKSGIVING MATH BATTLE

November 22, 2020

1. Convert to the regular fraction in the simplest form:

$$0.\overline{108}$$

2. Solve equation

$$|13x - 31| = 8$$

3. Simplify to non-fraction expression: (hint: use factorization)

$$\frac{3ab+2ac}{3b+2c} =$$

4. Add fractions:

$$\frac{1}{1-x} + \frac{1}{1+x} =$$

5. The numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 are written in a row. Can you put operations + and – between them so that the result is equal to zero?
6. In this sum the same letters represent the same digit, and different letters represent different digits. What are the letters?

$$\begin{array}{r} X \\ + \quad X \\ + \quad Y \, Y \\ \hline Z \, Z \, Z \end{array}$$

7. Jane bought some books. For the first book, she paid half of her money and 1 dollar more. For the second book, she paid half of the remaining money and 2 dollars more. Finally, for the third book, she paid half of the remaining money and 3 dollars more, thus spending all her money. How much money did Jane have at the very beginning?
8. In a 4-digit number  $\overline{abcd}$  the digits are  $a < b$ ,  $b < c$ , and  $c < d$ . What is the largest possible difference  $\overline{bd} - \overline{ac}$  for 2-digit numbers  $\overline{bd}$  and  $\overline{ac}$ ?