Lesson 11: Analyze Subtraction Algorithms

- Let's think about subtraction algorithms in more detail.

Warm-up: Number Talk: Subtract within 1,000

Find the value of each expression mentally.

- $400 - 200$

- $450 - 200$

- $450 - 205$

- $450 - 215$

11.1: Compare Two Subtraction Algorithms

1. The first steps of two algorithms are shown.

Algorithm A, step 1   Algorithm B, step 1

$$
\begin{array}{r}
\overset{4}{\cancel{5}}\,\overset{10}{\cancel{0}}\,\,8 \\
-\ 1\ 5\ 6 \\
\hline
\end{array}
$$

$$
\begin{array}{r}
5\ 0\ 8 \\
-\ 1\ 5\ 6 \\
\hline
2
\end{array}
$$

How are the steps different?

2. Use each algorithm to find the value of $824 - 541$.

11.2: Use an Algorithm?

Noah wanted to find the value of $301 - 167$ and wrote:

$$
\begin{array}{r}
3\ 0\ 1 \\
-\ 1\ 6\ 7 \\
\hline
\end{array}
$$

Elena said that we can't subtract this way because we would need more ones to subtract 7 ones, but there's a zero in the tens place of 301.

1. Do you agree with Elena's statement? Explain your reasoning.

   _____

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2. Show how you would use an algorithm (either Noah's or another algorithm) to find the difference between 301 and 167.