

Please do your work neatly on separate paper.

1. Veronica just moved here from Ecuador and is new to your class. You are teaching subtraction using the traditional "borrowing" algorithm. Veronica raises her hand and explains that she was taught to subtract differently in Ecuador. Below is her work.

$$\begin{array}{r}
 4 \ 5 \ 1 \\
 - 3 \ 8 \ 6 \\
 \hline
 \end{array}
 \longrightarrow
 \begin{array}{l}
 \text{add 10 to top} \\
 \text{and bottom rows}
 \end{array}
 \longrightarrow
 \begin{array}{r}
 4 \ 5 \ 11 \\
 - 3 \ 9 \ 6 \\
 \hline
 \end{array}$$

$$\longrightarrow
 \begin{array}{l}
 \text{add 100 to top} \\
 \text{and bottom rows}
 \end{array}
 \longrightarrow
 \begin{array}{r}
 4 \ 15 \ 11 \\
 - 4 \ 9 \ 6 \\
 \hline
 6 \ 5
 \end{array}$$

- (a) (1pt) Use Veronica's method to subtract $643 - 289$.
- (b) (3pts) Explain in detail how Veronica's method works. Make sure to include in your explanation why adding 10 and 100 to the top and bottom will not affect the outcome. You must also cite the appropriate subtraction model that Veronica's method is demonstrating.
2. You ask your class for their interpretation of the problem $6 \div 2$. Here are their answers.
- (a) If 6 is partitioned into 2 parts, how much is in each part?
- (b) How many times must you subtract 2 from 6 to get 0?
- (c) How many halves are in 6?
- (d) If 6 is twice a number, what is the number?
- (e) What is the ratio of 6 to 2?
- i. (1pt) **One** of the above five interpretations is incorrect. Circle it.
- ii. (1pts) Explain why the interpretation you circled is incorrect.
- iii. (2pts) Three of the remaining four correct interpretations can be classified as partitive, repeated subtraction, and missing factor. Match these three classifications with three of the four correct student interpretations. (One interpretation will not be used. Do not use any classification twice.)
3. (2pts) A student, Rhuniah, writes the following problem for another student:

The set of cool TV shows is set A and the set of shows that are on late is set B. Find $A \cap B$.

Is this a good real-world problem to demonstrate the intersection of sets? Explain your yes or no answer as you would explain it to Rhuniah.