Homework 5

Note about videos in 302A: We are using these videos **only** to examine ***children's thinking***.

There are examples of both good and bad teaching/interviewing in these videos and examples of children who appear to have had both positive and negative mathematical experiences.

It is beyond the scope of Math 302A/B to analyze the details of the techniques of teaching and interviewing occurring in these videos. You will likely explore these sorts of details in your math methods course in the College of Education.

1. **IMAP Video 06: Javier**

   Before Watching the Video

   Background from the Video Guide: "Javier is a fifth-grade student who spoke little English a year earlier."

   a. Come up with **two** strategies for solving 6×12 without using the standard U.S. algorithm. You do **not** need to give a mathematical explanation for why they work.

   After Watching the Video

   b. For Javier's work on 6×12 (you can combine your answers)
      i. First, *describe* what he did using a series of equations or arrow language ***and*** your own words.
      ii. Second, give a *mathematical explanation for why* this makes sense (a representation of some kind may help). You do not need to show how he got the 60, but explain why he can break apart the problem like that (again a picture may help).

   c. For Javier's work on 12×12 (you can combine your answers). *Describe* what he did using a series of equations or arrow language ***and*** your own words.

   d. A new problem
      i. Devise another problem on which Javier might use the same reasoning.
      ii. *Describe* how he might solve this new problem using a series of equations or arrow language ***and*** your own words.

   e. A 2-digit problem
      i. Write a 2-digit times 2-digit multiplication problem for which a student like Javier might apply an informal strategy.
      ii. *Describe* a possible strategy for solving this problem using a series of equations ***and*** your own words.

2. **Mayan Numbers**

   From Mayan to Hindu-Arabic

   a. Translate the number below from Mayan to Hindu-Arabic.
   b. Carefully explain your reasoning (use pictures if they help).

3. Textbook Problems

a. **Textbook Section 4.2 (p. 149)**

1 (give a place value based explanation, a picture may help), 3

b. **Textbook Section 4.5 (p. 179)**

4, 9 (do not need to explain why it's valid), 16

- **Notes / Special Directions**
  Any problem that mentions writing correct equations can be done either in arrow language or the way the book prefer
- Many problems ask you to identify the "properties of arithmetic"; **do not do this part** of the problem.

c. **Textbook Section 6.3 (p. 246)**

2a/b, 5, 7a, 8, 17, 19, 21, 23a/b, 26