Math 535 **Homework 2** **Due at 9:00 Wednesday, July 9**

1. In the textbook: Read Big Idea 1 on pp. 10-18. Answer these questions.

   a. Restate Essential Understanding #1a in your own words.

   b. Give your own example of a discrete quantity that can be compared without numerical values.

   c. Essential Understanding #1b -- Respond to "Reflect 1.1" on page 12.

   d. Essential Understanding #1c -- Make drawings of a balance scale to show the four statements that result from "Reflect 1.2."

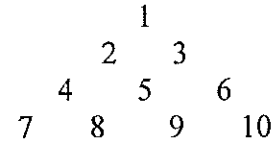
   e. Essential Understanding #1d -- Is the relation "is greater than" a transitive relation? Explain.

   f. Essential Understanding #1e -- Why do you think Hudson's strategy of a "won't get" question illustrates the problem better than a "How many more" question?

2. Use the 4-step problem solving process to solve this problem. Use the scoring rubric as a guide. Evaluate your solution on the scoring guide and attach one to your paper.

The Circus Has Arrived!

The circus has come to town. As part of the festivities, the clowns build a clown pyramid. For example, a four-layer clown pyramid would have 4 clowns on the bottom, 3 clowns standing on there shoulders, 2 clowns standing on the shoulders of the row below, and 1 clown on top. This four-layer clown pyramid would need 10 clowns to make it.



   a. Describe the pattern needed to build a clown pyramid. How many clowns would you need to build a ten-layer pyramid? a 20-layer pyramid? What is the general formula for finding how many clowns are needed to make a n-layer clown pyramid?

   b. What is the tallest clown pyramid could you build if you had 56 clowns available? 105 clowns available? What is the general formula for finding how many levels can be made if you have c clowns available?

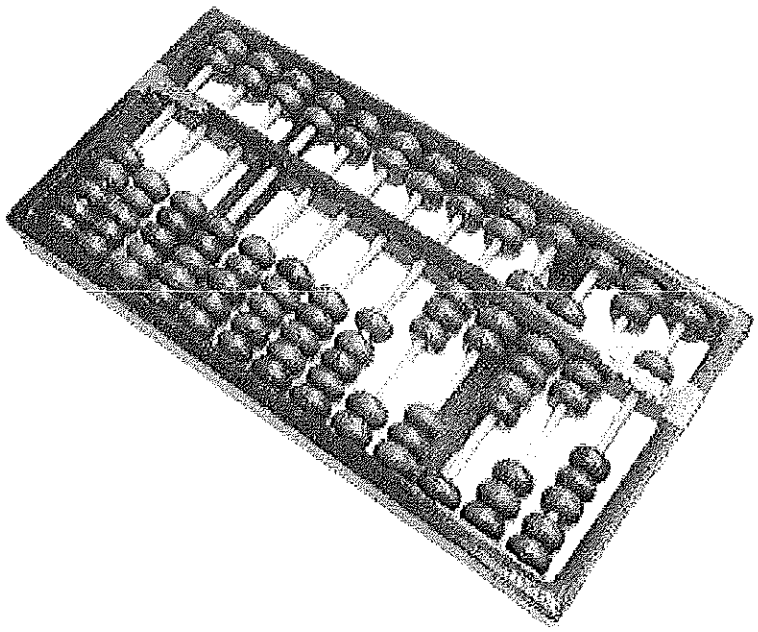
3. Skills Practice

a. Circle any that apply: The numbers in the diagram of the clowns in the problem above are: cardinal, ordinal, or nominal numbers? Explain your reasoning.

b. Study the attached two pages on Egyptian numerals.
   a. Is there place value in this system?
   b. Write in Egyptian numerals:
      i. 12
      ii. 356

c. Do #3 on the second page of Egyptian numerals in which you are asked to "Figure out the meaning of each symbol. Then translate each Egyptian numeral into an Indo-Arabic numeral."

c. Study this picture of a Chinese abacus. Write the Hindu-Arabic number that it represents.



Numbers in Stone in Ancient Egypt

Over 5,000 years ago, people in northern Africa and western Asia began to build cities and trade with one another. They needed to write numbers in order to keep track of business and make records of taxes. The people of Egypt and Sumer (also called Mesopotamia, now Iraq) developed *systems* of number signs, called numerals. The two systems were very different from each other. Here you will learn about the Egyptian system.

Egypt is in northeast Africa. It became a powerful country over 5,000 years ago. Large pyramids and temples were built for the king, whom they called the pharaoh (FAIR-oh). On the walls, workers carved stories about the pharaoh and great events, using symbols for their words and numbers called hieroglyphs (hy-roh-GLIFS).

The Egyptians had a different form of writing on papyrus, an early type of paper. For this writing they had a system of number symbols that are more like those we use today.

Here are some examples of Egyptian numbers in stone and their meanings:

3 40 39

Try This

1. Figure out the meaning of each symbol. Then write these Egyptian numerals our way, in Indo-Arabic numerals:

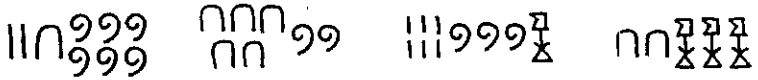
2. Compare the numerals:

 and 98

Which is easier to write, Egyptian hieroglyphs or Indo-Arabic numerals? Which is easier to understand?

3. This is the number 1,238 in hieroglyphs.

Figure out the meaning of each symbol. Then translate each Egyptian numeral into an Indo-Arabic numeral:



Think About This

1. Write a story about ancient Egypt that has at least four different numbers. Write the numbers the Egyptian way.
2. Compare the two systems: Egyptian hieroglyphic numbers and Indo-Arabic numerals. How are they alike? How are they different? If you mixed up the Egyptian symbols for the number 1,238, could you still read the number? Which way of writing makes more *number sense* to you?
3. Look up the Mesopotamian system of numeration. It is based on grouping numbers by tens and sixties. That's why we have sixty minutes in an hour and sixty seconds in a minute.