Bell Ringer for IB Math Studies SL, 11.30.11

1. List all of the formulas that you and your group figured out yesterday.
2. Comment on each of the formulas. How did you figure out the formula? What does the formula mean? (For instance, what does the 4 in f(x) = 4x +3 mean?)
3. How did the formula help you? Were there any limitations to the formula? Explain.

***Tower of Hanoi*** **Variations**

1. *Tower of Hanoi with Adjacency Requirement*: Suppose that in addition to the requirement that they never move a larger disk on top of a smaller one, the priests who move the disks of the Tower of Hanoi are also allowed only to move disks one by one from one pole to an *adjacent* pole. Assume poles *A* and *C* are at the two ends of the row and pole *B* is in the middle.

a. Find the minimum number of moves needed to transfer a tower of 2 disks from pole *A* to pole *C*.

b. Find the minimum number of moves needed to transfer a tower of 3 disks from pole *A* to pole *C*.

c. Find the minimum number of moves needed to transfer a tower of 4 disks from pole *A* to pole *C*.

d. Find the minimum number of moves needed to transfer a tower of *n* disks from pole *A* to pole *C*.

1. *Double Tower of Hanoi*: In this variation of the tower of Hanoi there are three poles in a row and *2n* disks, two of each of *n* different sizes, where *n* is any positive integer. Initially one of the poles contains all the disks. Disks are transferred one by one from one pole to another, but at no time may a larger disk be placed on top of a smaller disk. However, a disk may be placed on top of one of the same size and the adjacency requirement in problem #1 does not apply.

a. Find the minimum number of moves needed to transfer a tower of 4 disks from one pole to another.

b. Find the minimum number of moves needed to transfer a tower of 6 disks from one pole to another.

c. Find the minimum number of moves needed to transfer a tower of 8 disks from one pole to another.

d. Find the minimum number of moves needed to transfer a tower of *2n* disks from one pole to another.

You have to know how to accept rejection and reject acceptance.

 —Ray Bradbury

Example has more followers than reason.

 —Christian Nevell Bovee, author and lawyer