

MAT 300-02  
Spring 2008

Assignment 10

To be turned in on February 12.

- A. Use the method of false position to solve the following problem in the spirit of the methods of the ancient Egyptians.

A quantity and its  $\frac{2}{3}$  are added together and from the sum  $\frac{1}{3}$  of the sum is subtracted and 10 remains. What is the quantity?

- B. The Egyptians had techniques for dealing with certain computations. One such technique was for taking  $\frac{2}{3}$  of a unit fraction and expressing the result in terms of unit fraction. Given a unit fraction  $\bar{n}$ , the scribe would follow the instructions below, where the “it” refers to  $n$  and we are computing the denominators of unit fractions in the unit fraction decomposition of the result:

Take two times it.  
Take six times it

So, for example two thirds of  $\bar{5}$  is  $\bar{10} \bar{30}$ .

1. Verify using modern notation that two thirds of  $\bar{5}$  is  $\bar{10} \bar{30}$
2. Use the rule above to find two thirds of  $\bar{7}$ .
3. Using modern notation, state and prove the rule for any unit fraction  $\frac{1}{n}$ .  
(Hint: Show that the result of applying the rule equals  $\frac{2}{3} \cdot \frac{1}{n}$ .)