

Name & UID: _____

1. (100 points) Consider the following statement:

There exists two irrational numbers, a and b , such that a^b is rational.

In class, we presented a non-constructive proof of this statement. In this assignment you will prove this statement constructively.

- (a) (70 points) Prove that $\log_2 9$ is irrational.

- (b) (30 points) Choose two irrational numbers, a and b , and show that a^b is rational. You will need your result from part (a) to do this.