Name:_____   Name: _____

Name:_____   Name: _____

Hash Table Collision Probabilities

1. Consider *n* people with birthdays distributed uniformly at random.

   How large does *n* need to be before there is at least a 50% chance that two people have the same birthday? (Same question as: H*ow many objects need to be inserted before there is a 50% chance of a collision?*)

2. Let's say that we have an array with 100 buckets. What is the probability of a collision if we have a perfect hash function (generates hash values uniformly at random) and we try to store (note that $\prod_{i=1}^{x} \frac{n-i}{n} \sim e^{-x(x-1)/2n}$):
   - 10 values

   - 20 values,

   - 30 values