

Finding the Total Population

- 1) Suppose you wanted to know approximately how many bees were in a hive. Obviously you don't want to count every single bee, so you take a small sample of the bee hive. Your sample has 30 bees in it. On each of the bees in the sample, you made a small identifiable mark with a white marker. You then release these "tagged" bees back into the larger population of the hive. After some time under which you believe the tagged bees from the sample have mixed back in with the population of the hive, you take another sample. This second sample had 80 bees in it. In this second sample there are 10 of the tagged bees from the first sample. Write and solve a proportion to determine how many bees are in the hive.

- 2) Biologists tag fish to make predictions about fish populations in certain bodies of water. A biologist catches and tags 25 trout from a small lake, then throws them back. The next day, the biologist catches another 20 trout and 4 of those were tagged. Approximate the total number of trout in the lake.

- 3) A biologist needs to estimate the frog population in a large pond. She captures 75 frogs, tags them, and then releases them back into the pond. One week later she captures 50 frogs and observes that 7 are tagged. About how many frogs are in the pond?

- 4) You tag 312 deer and release them back in the wild. A year later, you collect a sample of 1,200 deer, 98 of which are tagged. Estimate the total deer population in that area.