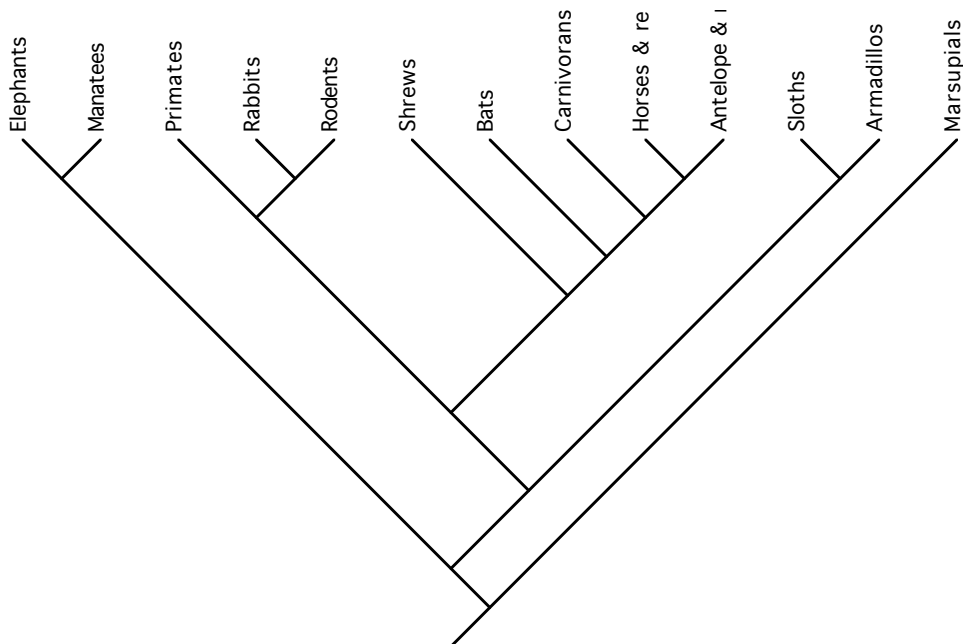
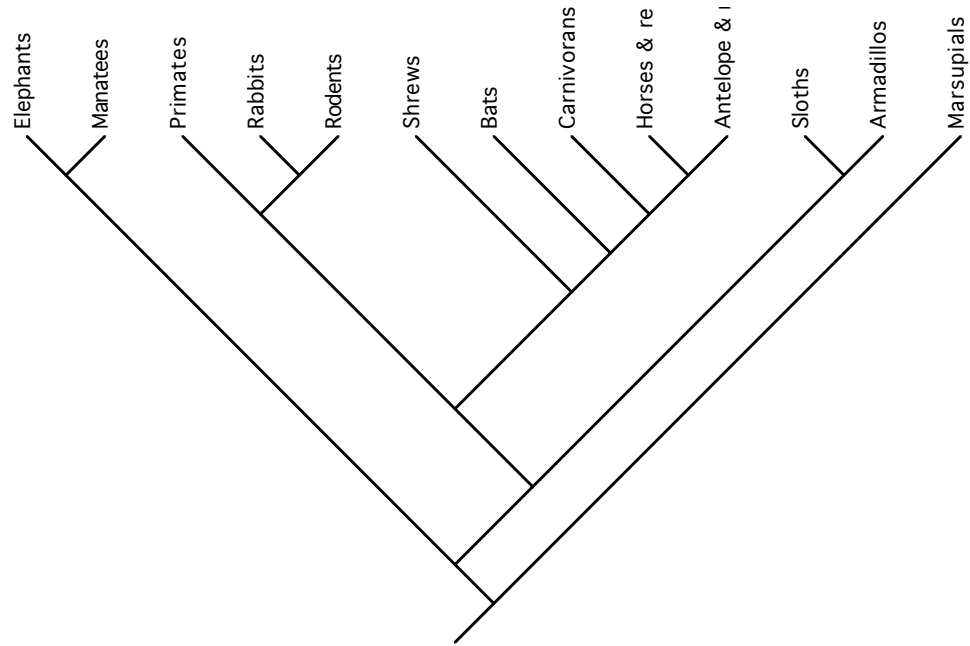
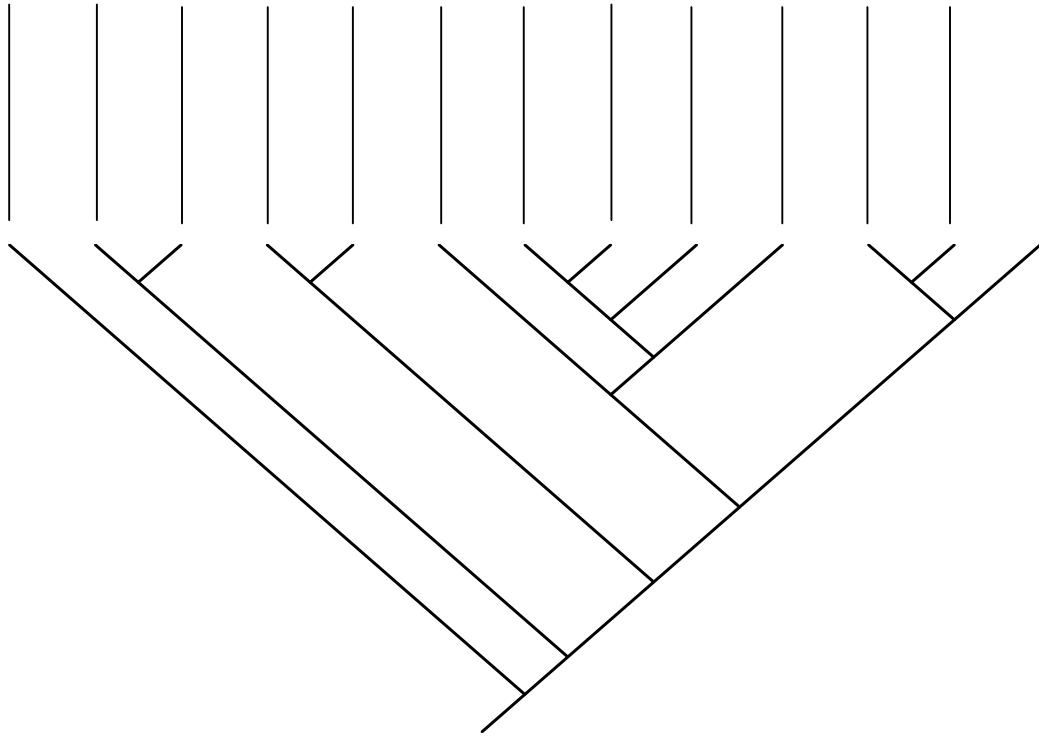


Problem Set 8

1. On the tree below, clearly indicate the following: (note second copy of tree provided so that your answer doesn't get too cluttered)
 - a. The sister group of carnivorans (2 pts)
 - b. The sister group of the lineage containing sloths and armadillos (2 pts)
 - c. The most recent common ancestor of sloths and shrews (2 pts)
 - d. The most recent common ancestor of elephants and primates (2 pts)
 - e. All taxa that are more closely related to shrews than they are to armadillos (2 pts)
 - f. All taxa that are more closely related to elephants than they are to marsupials (2 pts)
 - g. All lineages that are ancestral to rabbits (2 pts)
 - h. All lineages that are ancestral to bats (2 pts)



2. Fill in taxon names in the blanks on the tree above so that it shows the same relationships among mammals as the tree used in 1. (9 pts)



3. Draw the tree described by the following statements: Toothed whales and baleen whales share more evolutionary history with each other than they do with any other taxon. Their closest relatives are the hippos. Giraffes and deer are sister taxa, and they are more closely related to whales than they are to pigs. (6 pts)

4. Give two reasons that the root of a phylogenetic tree is significant. (4 pts)

5. Given the tree of mammals in Question 1 (and knowing that we are primates), evaluate the following statements as true (T) or false (F), or indicate that there is not enough information (NI) to answer the question: (2 pts each)

- We are more closely related to mice (which are rodents) than we are to bats.
- Shrews and bats share more of their evolutionary history than do shrews and antelopes.
- We are more closely related to rodents than horses are to antelopes.
- We are more closely related to rodents than to rabbits.
- The sister group of shrews is bats.
- The sister group of the lineage (elephants + manatees) is marsupials.
- The most recent common ancestor of elephants and manatees lived before the most recent common ancestor of rabbits and rodents.
- The most recent common ancestor of primates and shrews lived before the most recent common ancestor of bats and carnivorans.
- There is an ancestral species of mammals that gave rise to sloths and horses, but not to elephants.
- There is an ancestral species of mammals that gave rise to manatees and bats but not to armadillos.

6. Circle the trees that are the same phylogeny as tree 1. (5 pts)

