PROBLEMS INVOLVING DOMINANT/RECESSIVE PATTERN OF INHERITANCE

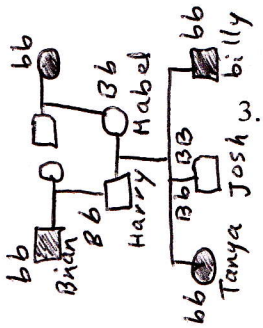
b = white
B = Black

	b	b
B	Bb	Bb
b	bb	bb

1. A female mouse, homozygous (pure breeding) for white coat colour, mated with a mouse heterozygous for black coat colour and produced eight offspring.
   a. Predict the colours of their coats, assuming black is dominant. 4 black, 4 white
   b. How many of the offspring would you expect to have white coats? 4
   c. How many of the offspring would you expect to be homozygous for black coat colour? 2

2. In cats one gene "***L***" controls the presence of long hair on the coat. The recessive gene "***l***" controls the short hair characteristic.

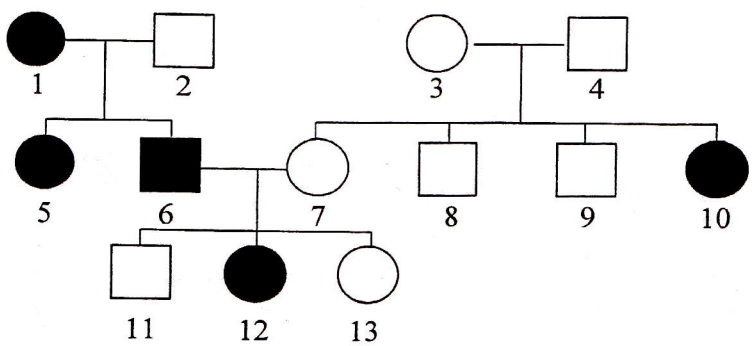
   Write down the genotype of a cat that is
   a. heterozygous for long hair. Ll
   b. short haired. ll
   c. If amongst the offspring of a long haired female cat and a long haired tomcat was a short haired kitten, work out the genotype of the parents. Ll x Ll



3. In humans, brown hair colour is dominant to red hair. Mabel's mother has red hair, as do Mabel's son Billy and daughter Tanya. Mabel's third child Josh has brown hair. Harry, who is Mabel's husband and Mabel herself, have brown hair. Harry's father, Brian, also has red hair. b = Red ; B = Brown

   Draw up a pedigree chart to show the inheritance of hair colour in this family.

4. This pedigree is for left-handedness, a recessive characteristic in humans.



l = left-handed
L = right handed

   a. What is the genotype of 10 and 12? ll
   b. What is the genotype of 3? Ll
   c. What is the genotype of 7? Ll
   d. From the pedigree chart, list those who are heterozygous (hybrid) for right-handedness. 2, 3, 4, 7, 11, 13
   e. List any individuals about whose genotype you are uncertain. 8, 9
   f. If 6 and 7 have another child, what is the chance that it will be left-handed?

	l	l
L	Ll	Ll
l	ll	ll

50%.