7.012 Genetics Section Problems

For each set of data below, determine the genotype of the parents in cross 1. Where it applies, indicate which phenotypes are dominant and which are recessive.

Mice I
a) cross 1: red-eyed mouse ________ X white-eyed mouse ________
   gives F1: all red-eyed
   cross 2: red-eyed F1 X red-eyed F1
   gives F2: 36 red-eyed
   13 white-eyed

b) cross 1: long-eared mouse ________ X short-eared mouse ________
   gives F1: 12 long-eared
   10 short-eared
   cross 2: long-eared F1 X long-eared F1
   gives F2: 36 long-eared
   13 short-eared

Flowers
   cross 1: blue-flowered plant ________ X white-flowered plant ________
   gives F1: all pale-blue-flowered
   cross 2: pale-blue F1 X pale-blue F1
   gives F2: 27 blue
   49 pale-blue
   24 white

Blood Type
a) cross 1: person, type A blood ________ X person with type B ________
   gives F1: all type AB blood
   cross 2: type AB F1 X type AB F1
   gives F2: 2 type A
   4 type AB
   1 type B
Blood Type, continued

b) cross 1: type A blood ____________ X type B ____________
   gives F1: 2 type A blood
             3 type AB blood
             1 type B blood
             2 type O blood

Mice II
a) cross 1: tail-less mouse ____________ X normal mouse ____________
   gives F1: 10 tail-less
             9 normal

cross 2: tail-less F1 X tail-less F1
   gives F2: 10 normal
             21 tail-less
             9 dead

b) cross 1: blue-eyed, long-toothed mouse X brown-eyed, short-toothed mouse
       ____________ X ____________
   gives F1: all blue-eyed, short-toothed

cross 2: blue-eyed, short-toothed F1 X blue-eyed, short-toothed F1
   gives F2: 92 blue-eyed short-toothed
             31 blue-eyed long-toothed
             29 brown-eyed short-toothed
             9 brown-eyed long-toothed

Plants
   cross 1: tall, green plant ____________ X short, yellow plant ____________
   gives F1: 20 tall green
             20 short green

cross 2: tall, green X short, yellow (different plants than (b))
   gives F1: 19 tall green
             21 tall yellow