7.013 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: mammal, type A blood ____________ X mammal 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 above)
   gives F₁: 19 tall green
             21 tall yellow