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 F_1: all red-eyed

cross 2: red-eyed F_1 **X** red-eyed F_1

gives F_2: 36 red-eyed
13 white-eyed

b) cross 1: long-eared mouse _____ **X** short-eared mouse _____

gives F_1: 12 long-eared
10 short-eared

cross 2: long-eared F_1 **X** long-eared F_1

gives F_2: 36 long-eared
13 short-eared

Flowers

cross 1: blue-flowered plant _____ **X** white-flowered plant _____

gives F_1: all pale-blue-flowered

cross 2: pale-blue F_1 **X** pale-blue F_1

gives F_2: 27 blue
49 pale-blue
24 white

Blood Type

a) cross 1: person, type A blood _____ **X** person with type B _____

gives F_1: all type AB blood

cross 2: type AB F_1 **X** type AB F_1

gives F_2: 2 type A
4 type AB
1 type B

Blood Type, continued

b) cross 1: type A blood _____ **X** type B _____

gives F_1: 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 F_1: 10 tail-less
9 normal

cross 2: tail-less F_1 **X** tail-less F_1

gives F_2: 10 normal
21 tail-less
9 dead

b) cross 1: blue-eyed, long-toothed mouse **X** brown-eyed, short-toothed mouse

_____ **X** _____

gives F_1: all blue-eyed, short-toothed

cross 2: blue-eyed, short-toothed F_1 **X** blue-eyed, short-toothed F_1

gives F_2:

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 F_1:

20	tall	green
20	short	green

cross 2: tall, green **X** short, yellow (different plants than (b))

gives F_1:

19	tall	green
21	tall	yellow