

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: 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 above)
gives F₁: 19 tall green
21 tall yellow