

Genetics Practice Problems

1. You run the following cross of a purple-flowered long-petaled plant with a homozygous recessive peach-flowered short-petaled plant and get the following offspring:

- 59 purple-flowered long-petaled plants
- 75 peach-flowered short-petaled plants
- 5 purple-flowered short-petaled plants
- 10 peach-flowered long-petaled plants

How far apart are your genes?

2. You conduct a series of crosses to orient the locations of five different genes: gene A, gene B, gene C, gene D, and gene E. Through these crosses, you find the following pairwise distances:

- A and C are 39 cM apart.
- A and E are 10 cM apart.
- D and B are 2 cM apart.
- D and C are 15 cM apart.
- E and D are 15 cM apart.
- A and D are 25 cM apart.
- D and C are 14 cM apart.

All the genes are on the same chromosome. What is the order of genes on this chromosome?



3. You conduct a series of crosses to replicate Mendel's pea plant experiments. As we discussed in earlier examples, smooth is completely dominant to wrinkled, and green is completely dominant to yellow. If you crossed a heterozygous smooth green pea plant with a wrinkled yellow pea plant, what phenotypic ratio would you expect in the offspring?

4. If you have a plant with an unknown genotype, what would you cross it with to determine if it is a heterozygote or homozygote?

5. You conduct a testcross with another individual that has three genes you are interested in (ABC). The offspring look like this:

- 400 ABC
- 380 abc
- 49 ABc
- 53 abC
- 23 Abc
- 35 aBC
- 2 AbC
- 4 aBc

How do you explain genotype AbC?

