

Problem set 2 answers

Problems from text: 16.21, 16.22, 16.25

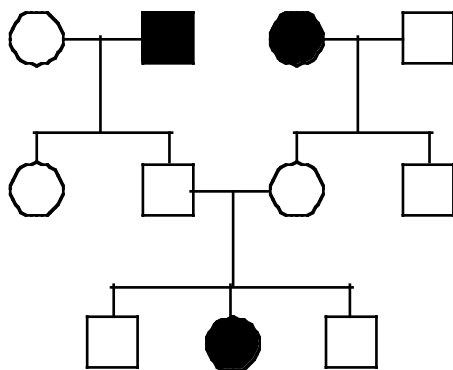
1. You are given two haploid yeast strains, A and B that are petite (no mitochondrial function). You cross A and B and obtain grande diploids. You grow the diploids for a few generations, sporulate them, and analyze 100 tetrads. All 100 tetrads produced two grande spores and two petite spores. What kinds of petites were A and B? Be as specific as possible, and explain your reasoning

2. You are given a true breeding variant of squash that has yellow leaves (wild-type squash has green leaves). You cross this squash variant as the female parent with a wild-type squash as a male parent and find that all the progeny have yellow leaves. You propose that yellow leaves are dominant to green leaves, or that this is an example of maternal inheritance or that this is an example of

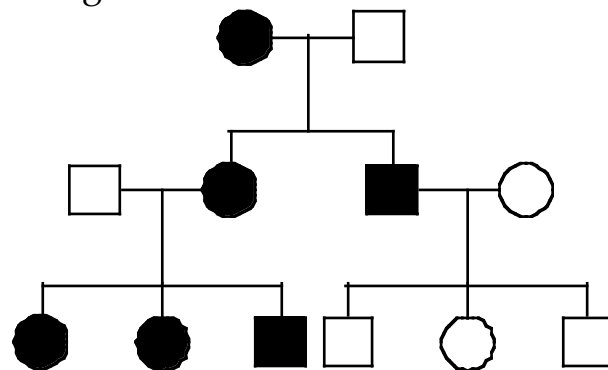
of a maternal effect gene. Describe a single genetic experiment to distinguish among these possibilities and the results for each scenario.

3. The affected individuals in the two pedigrees shown below display an optic nerve degeneration defects that leads to blindness.

Pedigree 1



Pedigree 2



a) What are the modes of inheritance for the diseases in the two pedigrees. b) Describe a plausible explanation for this defect.