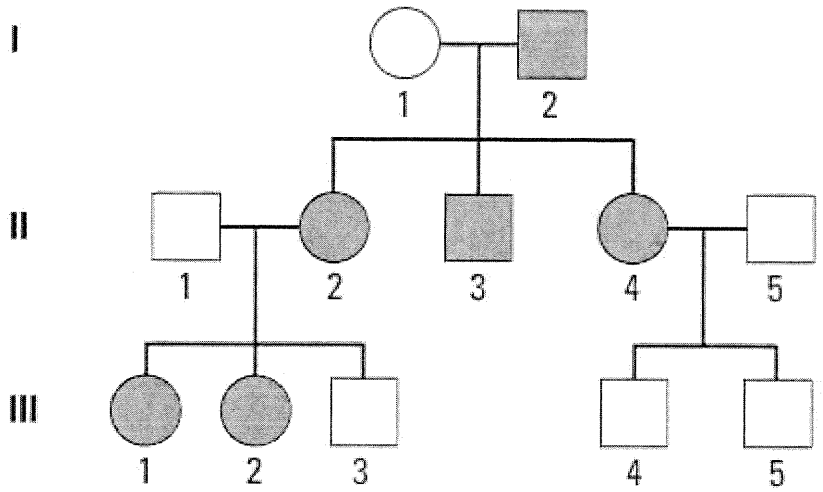
DATE: NAME: CLASS:

CHAPTER 17 HANDOUT	**Pedigree Problem Worksheet**	BLM 17.3.5

1. Marfan syndrome is an inherited condition that affects the connective tissue, resulting in unusually long bones and spinal curvature, as well as vision, cardiac, and respiratory problems. The syndrome tends to become increasingly severe over time. The following pedigree shows inheritance of Marfan syndrome in a multigenerational family.



a) How is this syndrome inherited?

_____

_____

b) Can you determine individual II4's genotype? Explain.

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_____

c) Individual II1 and II2 are considering having another child. What is the probability that this child will have Marfan syndrome? Explain using a Punnett square.

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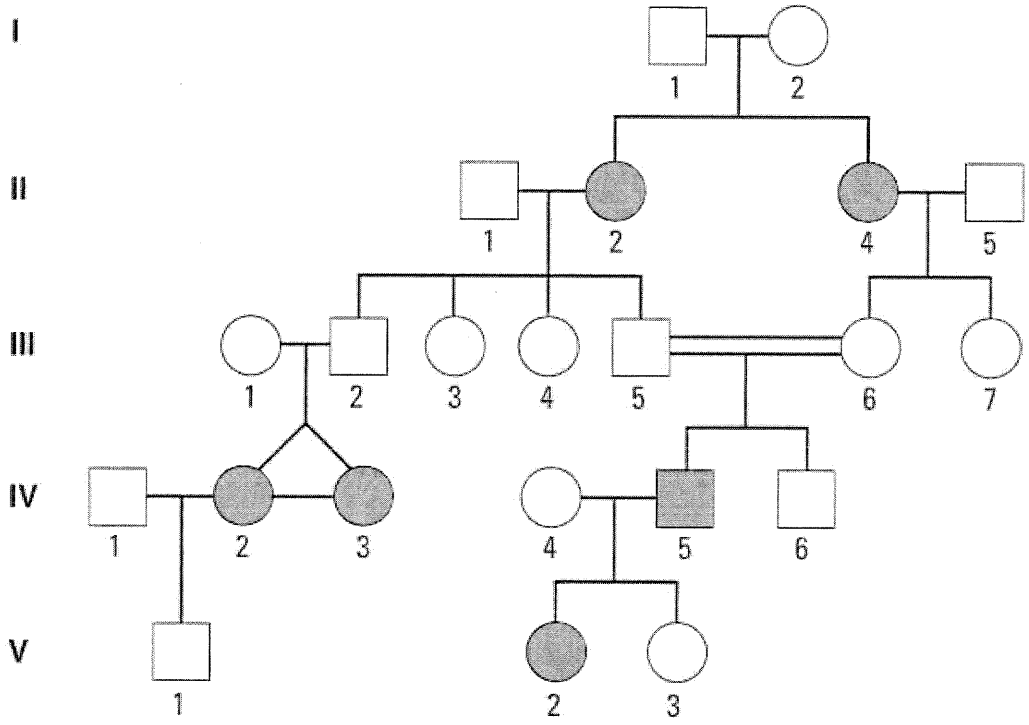
2. Examine the following pedigree showing the inheritance of straight hair in a four-generation family.



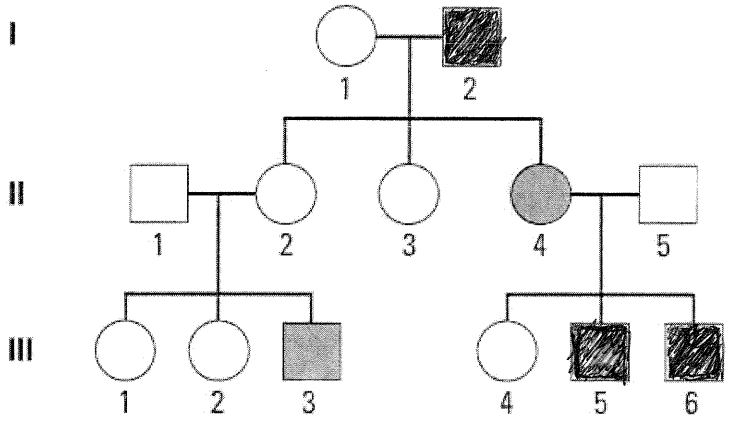
a) Is straight hair a dominant or recessive trait? Explain.

b) Identify the genotype of each individual in the pedigree. Whose genotype can you not be certain of?

c) If individual V3 marries a man who is heterozygous, what is the probability that they will have a girl with straight hair? Explain using a Punnett square.

3. Humans may have a peaked or smooth hairline. If a man and a woman both have a smooth hairline, none of their children will have peaked hairlines. How is a peaked hairline most likely inherited? Draw a pedigree for a family where one parent and two of three children have a peaked hairline. One of the children with a peaked hairline marries an individual with a smooth hairline. Their children both have a peaked hairline. Identify the genotypes and phenotypes of each individual.

4. As a top research scientist, you and your colleagues have discovered a new sex-linked recessive condition. In the course of your research, you have come across a pedigree (see below) for a family in which the condition occurs.

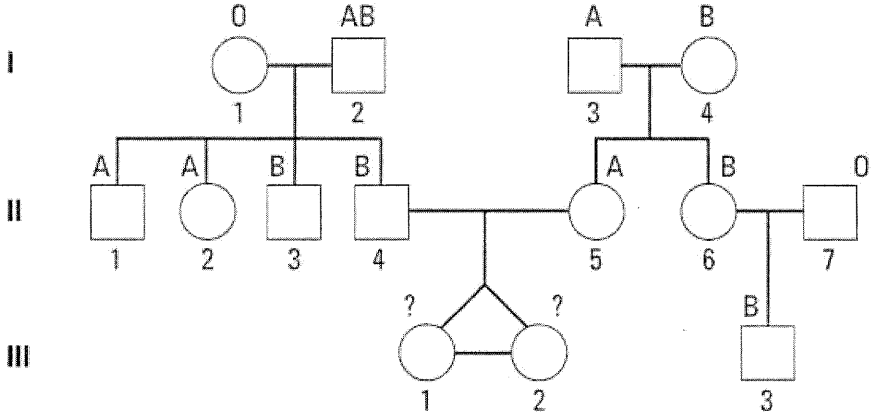


a) On which chromosome is the allele for the condition found?

b) Which individuals in the pedigree can you be certain are carriers of the allele? Explain your reasoning.

c) If individual III3 has a son with a woman who is not a carrier of the allele, what is the probability that the son will have the condition? Explain.

5. In the pedigree below, different blood types are identified by the letters A, B, AB, and O.



a) Individuals II4 and II5 have just had identical twin girls. List the possible blood types these infants may have based on the information provided in the pedigree.

b) Individuals II6 and II7 have a second child with blood type O. What does this tell you about II6's genotype?

c) Could I1 and I2 have a child with the AB blood type? Explain why or why not.