

ABO BLOOD SYSTEM PROBLEMS

Note: The alleles for Type A and Type B are codominant over the allele for Type O blood.

1. Write the genotypes of the following individuals:
 - a. homozygous Type B
 - b. Type AB
 - c. Type O
2. A child has type A blood. What are ALL the possible blood types of its parents. Show each cross to prove that it is possible.
3. For ABO blood groups, the A and B alleles are codominant, but both A and B are dominant over type O. Indicate the blood types possible from the mating of a male with blood type O to a woman with blood type AB. Could a female with blood type AB ever produce a child with blood type AB? Could she ever have a child with blood type O?
4. A woman who has blood type A marries a man with blood group B. Both had mothers with blood type O. Determine the possible blood types of their children.
5. A man with blood group AB marries a woman with blood group B. The woman's mother has blood group A. What are the genotype and phenotype blood group possibilities of their children?
6. A man has type A blood and his wife has type B. A child is born with type O. He accuses his wife of infidelity, saying that this must mean that he is not the father of the child.
 - a. Is there any justification for his suspicions on the basis of this evidence?
 - b. The man was Rh⁺ (positive) while both his wife and the child were Rh⁻ (negative). The Rh positive allele is dominant over the Rh negative allele. Does this help solve the problem? Explain.
 - c. The man's parents were both homozygous for Type A blood. Does this knowledge help the situation? Explain.
 - d. The woman's parents were both homozygous for Type B blood. Now what does this tell you? Explain.
7. After eight years of married life, during which time she had frequent intercourse with her husband, a woman failed to become pregnant. During the next five years, Mrs X fell in love with Mr. Y. and had three children. After the children were born the woman, her husband and Mr. Y came to an understanding and wished to determine which one was the father of each child. Determine the father of each child. The blood of those involved were examined with the following results:

Husband	O	MN
Mr. Y	A	N
Wife	O	MN
1 st Child	O	MN
2 nd Child	O	M
3 rd Child	A	N

Note: M and N are two more blood factors that we can test. M and N are codominant.

8. A nurse at a hospital removed the wrist tags of three babies in the maternity ward. She needs to figure out which baby belongs to which parents, so she checks their blood types. Using the chart below, match the baby to its correct parents. Show the crosses to prove your choices.

Parents	Blood Types		Baby	Blood type
Mr. Hartzel	O			
Mrs. Hartzel	A		Jennifer	O
Mr. Simon	AB		Rebecca	A
Mrs. Simon	AB		Holly	B
Mr. Peach	O			
Mrs. Peach	O			