Codominance Worksheet (Blood types)

Name_____
Period _____ Date _____

Human blood types are determined by genes that follow the **CODOMINANCE** pattern of inheritance.
There are two dominant alleles (A & B) and one recessive allele (O).

Blood Type (Phenotype)	Genotype	Can donate blood to:	Can receive blood from:
O	ii (OO)	A,B,AB and O (universal donor)	O
AB	I^AI^B	AB	A,B,AB and O (universal receiver)
A	I^AI^A or I^Ai (I^AO)	AB, A	O,A
B	I^BI^B or I^Bi (I^BO)	AB,B	O,B

1. Write the genotype for each person based on the description:
   a. Homozygous for the "B" allele _____
   b. Heterozygous for the "A" allele _____
   c. Type O _____
   d. Type "A" and had a type "O" parent _____
   e. Type "AB" _____
   f. Blood can be donated to anybody _____
   g. Can only get blood from a type "O" donor _____

2. Pretend that Brad Pitt is homozygous for the type B allele, and Angelina Jolie is type "O." **What are all the possible blood types of their baby?** *(Do the punnett square)*

   _____

3. Complete the punnett square showing all the possible blood types for the offspring produced by a type "O" mother and an a Type "AB" father. **What are percentages of each offspring?**

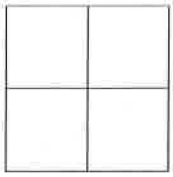
   _____

4. Mrs. Essy is type "A" and Mr. Essy is type "O." They have three children named Matthew, Mark, and Luke. Mark is type "O," Matthew is type "A," and Luke is type "AB." Based on this information:
   a. Mr. Essy must have the genotype _____
   b. Mrs. Essy must have the genotype _____ because _____ has blood type _____
   c. Luke cannot be the child of these parents because neither parent has the allele _____.

5. Two parents think their baby was switched at the hospital. Its 1968, so DNA fingerprinting technology does not exist yet. The mother has blood type "O," the father has blood type "AB," and the baby has blood type "B."
   a. Mother's genotype: _____
   b. Father's genotype: _____
   c. Baby's genotype: _____ or _____
   d. Punnett square showing all possible genotypes for children produced by this couple.

e. Was the baby switched? _____

6. Two other parents think their baby was switched at the hospital. Amy the mother has blood type "A," Linville the father has blood type "B," and Priscilla the baby has blood type "AB."



a. Mother's genotype: _____ or _____

b. Father's genotype: _____ or _____

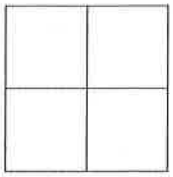
c. Baby's genotype: _____

d. Punnett square that shows the baby's genotype as a possibility

e. Could the baby actually be theirs? _____

7. Based on the information in this table, which men **could not** be the father of the baby?

*(hint... look at the baby's blood type only...)*_____
You can use the Punnett square if you need help figuring it out.



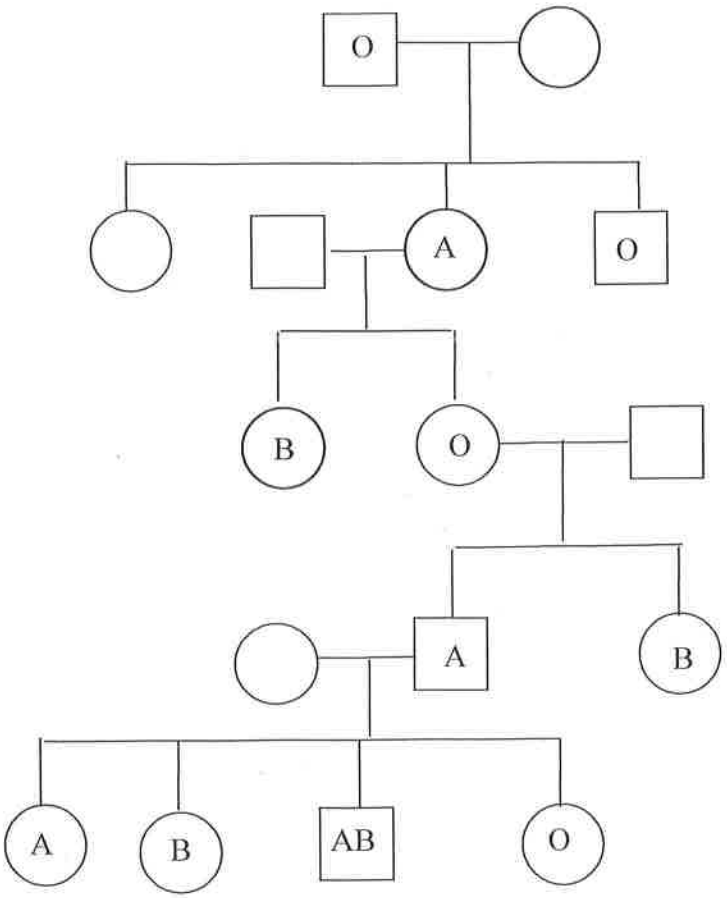
Name	Blood Type
Mother	Type A
Baby	Type B
The mailman	Type O
The butcher	Type AB
The waiter	Type A
The cable guy	Type B

8. The sister of the mom above also had issues with finding out who the father of her baby was. She had the state take a blood test of potential fathers. Based on the information in this table, why was the baby taken away by the state after the test?

*(hint... look at the baby's blood type only...)*_____

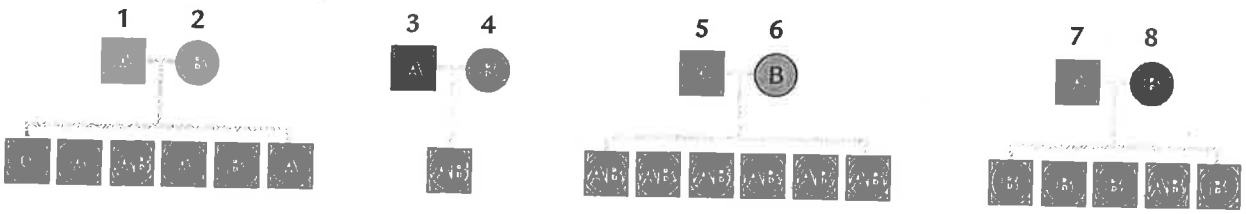
Name	Blood Type
Mother	Type O
Baby	Type AB
Bartender	Type O
Guy at the club	Type AB
Cabdriver	Type A
Flight attendant	Type B

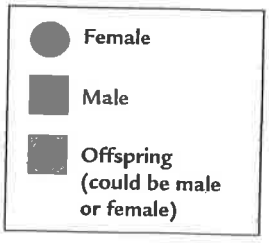
3. The pedigree below shows the blood types of some individuals. List all of the possible genotypes of the individuals and determine the blood group AND genotype of the missing blood groups.



1. The following pedigrees represent the blood types in four unrelated families. In each case, the parents have Type A and Type B blood.

FOUR BLOOD TYPE PEDIGREES





a. Which of the eight parents are definitely heterozygous for the Type O allele? Explain.

b. Which of the eight parents are probably not heterozygous for the Type O allele? Explain.

c. Can you be certain that the parents you named in response to Question 1b do not have a Type O allele? Explain.