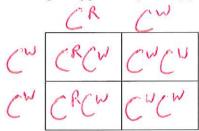
## **Genetics Practice 3: Advanced Mendelian Genetics**

**Incomplete Dominance** 

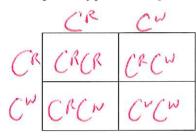
1. In radishes, the gene that controls color exhibits incomplete dominance. Pure-breeding red radishes crossed with pure-breeding white radishes make purple radishes. What are the genotypic and phenotypic ratios when you cross a purple radish with a white radish?



50% CRCW, 50% WHIK (1:1) PHENOTYPE

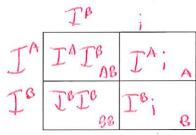
Codominance

2. Certain breeds of cattle show co-dominance in coat color. When pure breeding red cows are bred with pure breeding white cows, the offspring are roan. Summarize the genotypes & phenotypes of the possible offspring when a roan cow is mated with a roan bull.



25% red 50% rown, 25% white (1:2:1) PHENOTYPE 25% CRCR, 50% CRCW, 25% CMCW (1:21) GENOTIPE

3. A man with type AB blood marries a woman with type B blood. Her mother has type O blood. List the expected phenotype and genotype frequencies of their children.



25% AB, 25% A, 50% B PHENOTYPE 25% I<sup>A</sup>IB 25% I<sup>A</sup>; 25% I<sup>C</sup>IP, GENOTYPE

4. The father of a child has type AB blood. The mother has type A Which blood types can their children NOT have?

O, AB

5. A woman with type A blood and a man with type B blood could potentially have offspring with what blood types?

AB, A,B, O

6. The mother has type A blood. Her husband has type B blood. Their child has type O blood. The father claims the child can't be his. Is he right?

No: (IA: x IB!)

7. The mother has type B blood. Her husband has type AB blood. Their child has type O blood. The father claims the child can't be his. Is he right?

YES.

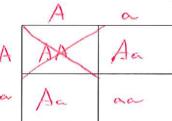
## **Genetics Practice 3: Advanced Mendelian Genetics**

8. The mother has type AB blood. The father has type B blood. *His* mother has type O blood. What are all the possibilities of blood type for their children?

AB, A, B

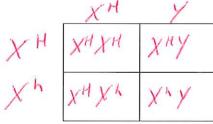
## Lethal Dominant

9. Achondroplasia (dwarfism) is caused by a dominant gene. A woman and a man both with dwarfism marry. If homozygous achondroplasia results in death of embryos, list the genotypes and phenotypes of all potential live-birth offspring. What is the expected ratio of dwarfism to normal offspring?



## Sex-Linked

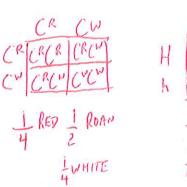
10. The genes for hemophilia are located on the X chromosome. It is a recessive disorder. List the possible genotypes and phenotypes of the children from a man normal for blood clotting and a woman who is a carrier. (HINT: You have to keep track of what sex the children are!)



2 norm 17 (1 carry, Inorm 18, 1 he	MO, O THENOITE
XHXH XHXL XHY XHY	GENOTYPE

# Dihybrid

Remember those roan cows from question 2? They also have a second gene for horn versus hornless cattle. The allele for horns dominates the allele for hornless. If a bull and cow are heterozygous for <u>both genes</u>, what are the probabilities for each possible phenotype?



for each possible phenotyp	
HORNED, RED	3 x = 18.75% (3)
HORNED, ROAN	毒×=37.5% (量)
HERENED, WHITE	3 x= 18.75% (36)
HORNLESS, RED	+ x = 6.25% (16)
HORNRESS, ROAN	1 x = 12.5% (-8)
HORNLESS, WHITE	1 24=6.25% (16)
	4