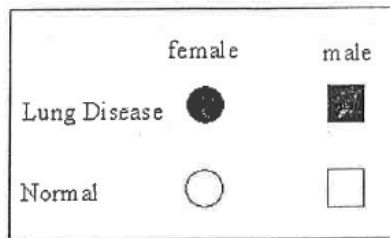
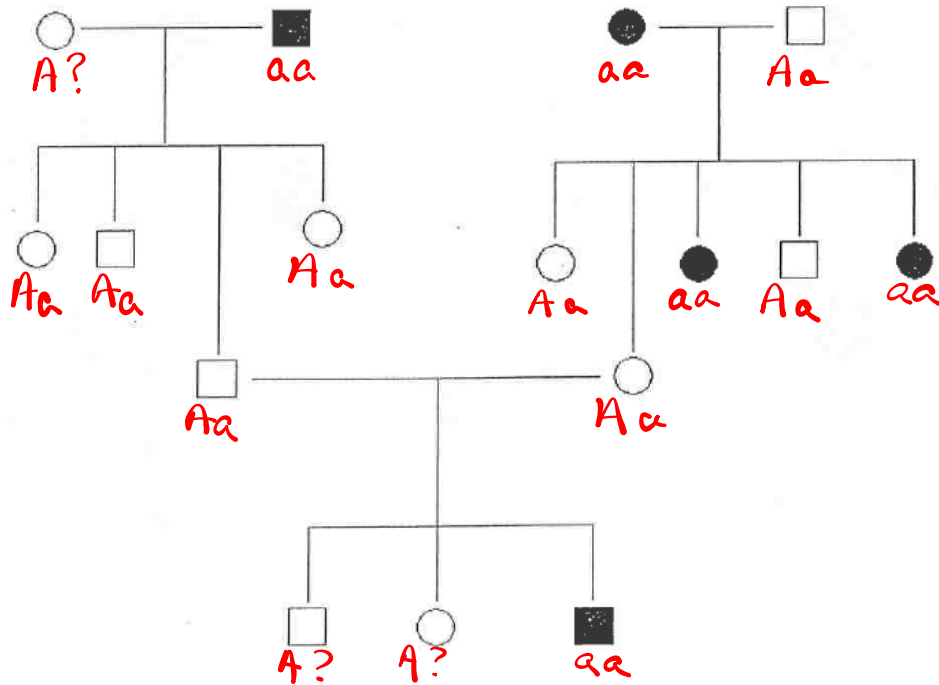


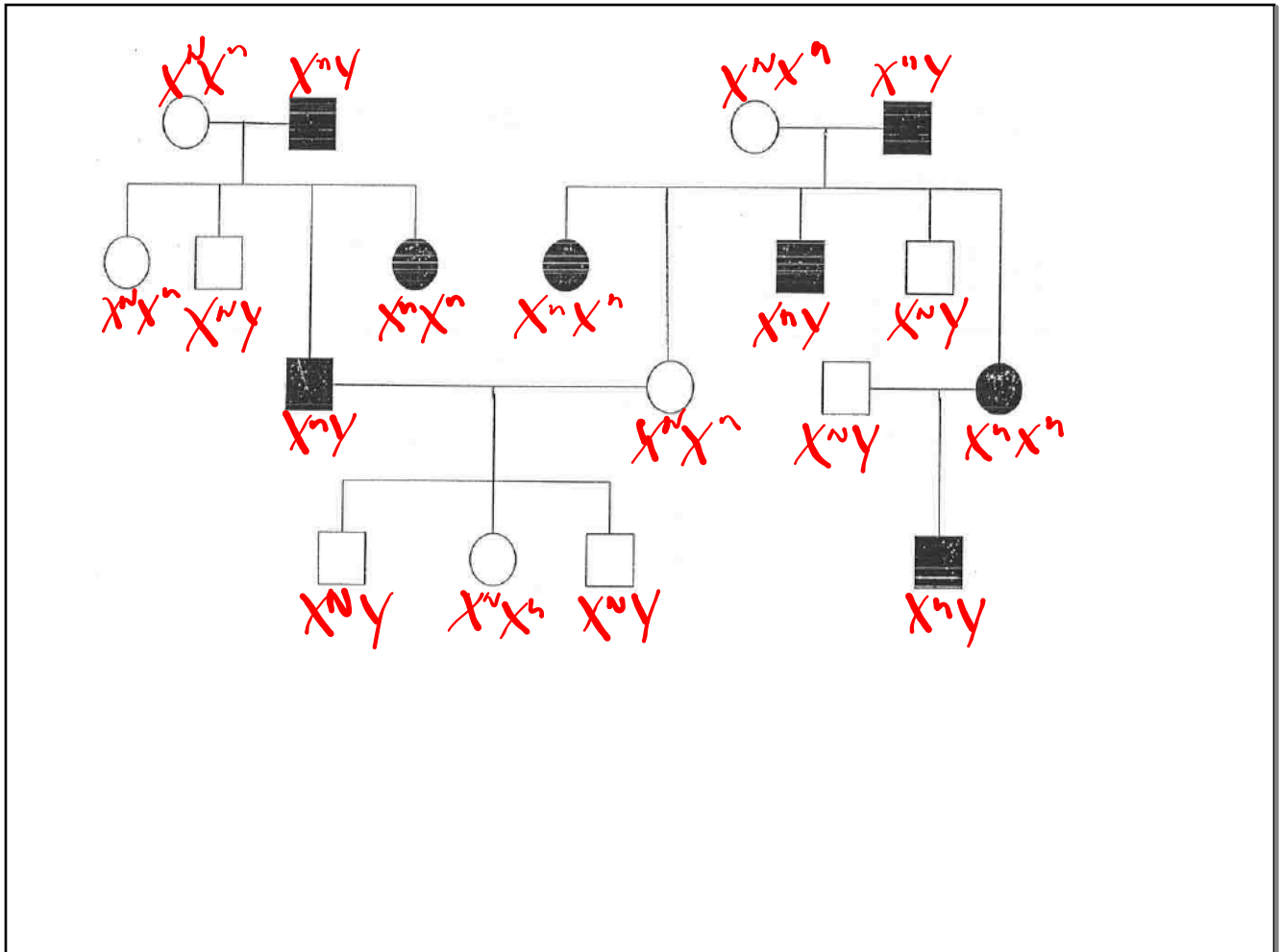
Key:

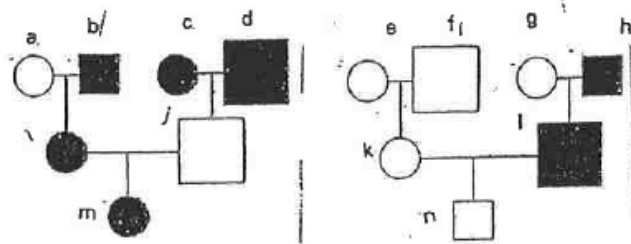


A = normal  
a = disease

choose:  $\left\{ \begin{array}{l} AA \\ Aa \\ aa \\ A? \end{array} \right.$







1 a. Is the gene for this type of dwarfism dominant or recessive? \_\_\_\_\_

b. How do you know? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2 a. Is the gene for red hair dominant or recessive to the gene for dark hair? \_\_\_\_\_

b. How can you tell? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

3 Using the symbols  $R$  and  $r$  for hair coloring and  $D$  and  $d$  for height, indicate for each box (male) and circle (female) on the chart the genotype of the individual with respect to dwarfism and hair color. Use a question mark for any gene that cannot be identified.

- |          |          |
|----------|----------|
| a. _____ | h. _____ |
| b. _____ | i. _____ |
| c. _____ | j. _____ |
| d. _____ | k. _____ |
| e. _____ | l. _____ |
| f. _____ | m. _____ |
| g. _____ | n. _____ |

# Single-factor cross:

Mendel

P: TT x tt — true-breeding  
 tall short

F<sub>1</sub>: 100% tall (Tt)

F<sub>1</sub> cross: Tt x Tt

F<sub>2</sub>: 75% tall 25% short

genotype: 1:2:1

phenotype: 3:1

	T	T
t	Tt	Tt
t	Tt	Tt

	T	t
T	Tt	Tt
t	Tt	tt

round, yellow      wrinkled, green

P<sub>1</sub>: RRYY × rryy

F<sub>1</sub>: RrYy - round, yellow

F<sub>1</sub> cross: RrYy × RrYy

GAMETES: "FOIL"

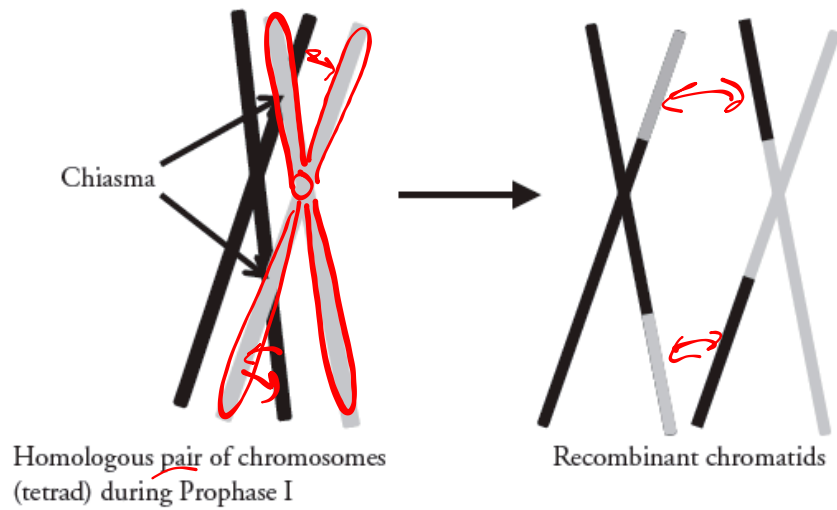
9:3:3:1

9    ||||    ||||  
 3    |||  
 3    |||  
 1    |

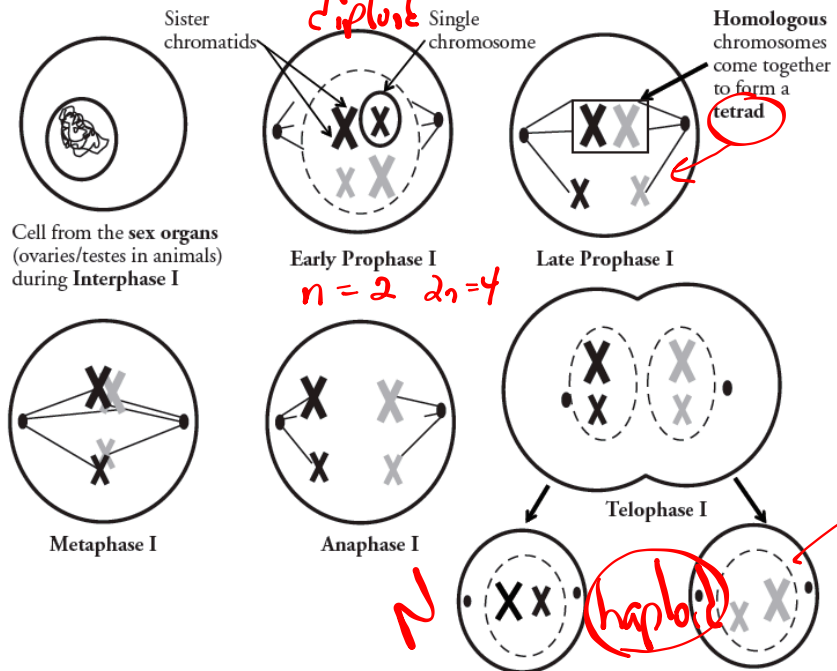
	RY	Ry	rY	ry
RY	RRYY	RRYy	RrYY	RrYy
Ry	RRYy	RRyy	RrYy	Rryy
rY	RrYY	RrYy	rrYY	rrYy
ry	RrYy	Rryy	rrYy	rryy

Hh

### Model 4 – Crossover of DNA in Chromosomes



Model 1 – Meiosis I



Cell from the sex organs (ovaries/testes in animals) during Interphase I

Early Prophase I  
 $n = 2$   $2n = 4$

Late Prophase I

Metaphase I

Anaphase I

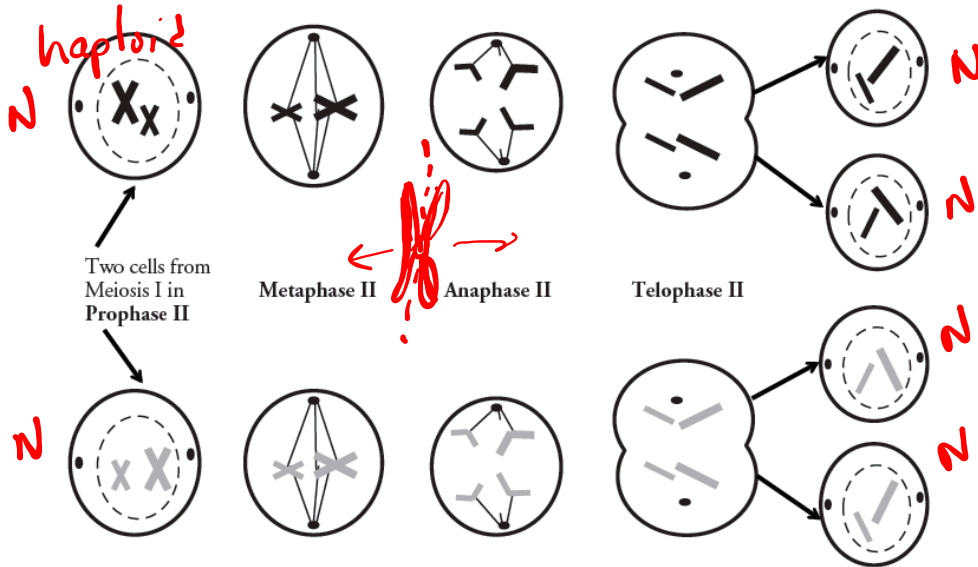
Telophase I

$N$  (haploid)

duplicated



Model 2 – Meiosis II



*N haploid*

Two cells from Meiosis I in Prophase II

Metaphase II

Anaphase II

Telophase II

*N*

*N*

*N*

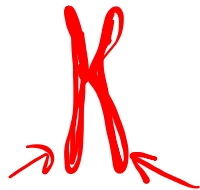
*N*

*N*

*single chromosomes*

homologous chromos. = Same genes in  
XX xx Same order - 1 from  
ea. parent

Sister chromatids - 1 chromosome,  
2 identical copies

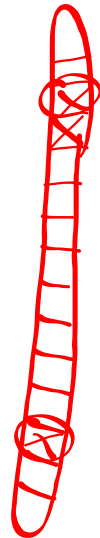


(IA)  
(I<sub>b</sub>) A B - codom. - universal recipients

(i) O - rec.

↳ universal donor

Gene maps



Chromosomes

assort.

independently.

Not alleles