

*This review is not all inclusive. Details are on blog: Go to Unit 4, Test Review

****Mitosis and Meiosis reviews were given before you took the quiz. Reviews are on my blog.**

1. Explain the difference between the following & provide an example of each:
 - a. genotype & phenotype
 - b. homozygous & heterozygous
 - c. recessive & dominant
 - d. complete dominance, incomplete dominance, and codominance
 - e. true/pure breed vs. hybrid
 - f. autosome vs. sex chromosome
 - g. allele, gene, and homologous chromosome
 - h. chromosome vs. sister chromatid
 - i. law of segregation vs. law of independent assortment
 - j. polygenic inheritance vs. multiple alleles
 - k. somatic cell vs. gamete
 - l. haploid vs. diploid
 - m. monohybrid vs. dihybrid
2. What happens in metaphase I of meiosis that explains the law of independent assortment?
3. Answer the following questions about Mendel's P, F1, and F2 generations.
 - a. What does each stand for?
 - a. P –
 - b. F1 –
 - c. F2 –

- b. What will result from the below P1 cross in each successive generation? Show the Punnett squares and find expected genotypes & phenotypes of F1 and F2.

a. P1 - **TT x tt**

b. F1 –

c. F2 –

4. Determine a P1 cross (complete dominance) that would result in a 3:1 phenotypic ratio among offspring Show the Punnett square. *Use letters A and a
5. If a trait for free earlobes is autosomal recessive, and a female has free earlobes, what is her genotype?
What is her phenotype?
6. Can both males and females be carriers of an autosomal recessive disorders? Why or why not?
7. Is it possible for males or females to be carriers of a sex-linked recessive disorders? Explain.
8. A cross was done between 2 flowers (incomplete dominance) and all the offspring were pink.
a. Draw a Punnett square showing this cross. Use letters B and B'

- b. What are the genotypes of the parents?
c. What are the phenotypes of the parents?
d. What is the genotypic ratio?
e. What is the phenotypic ratio?
9. If you were to cross two roan (red and white) cattle, what would be the chances of the offspring having a red phenotype (assume alleles exhibit codominance)? Show the Punnett square.

10. Answer the following questions about the dihybrid cross of DdEe X DdEe. *Assume alleles are on different chromosomes and independently assort
a. Perform the Punnett square.

- b. How many of the offspring would be dominant for both traits?
- c. How many of the offspring would be ddee?
- d. What is the phenotypic ratio?
- e. Based on 'd', if actual crosses were performed using 1000 organisms, approximately what would you expect the ratios to be?

11. If a female that is colorblind (a sex-linked recessive trait) and is crossed with a normal male, what expected genotypes and phenotypes would be possible in the offspring? ***For the test, you must KNOW that R/G colorblindness is sex-linked. That info will NOT be given to you on the test!**

12. Why are sex-linked traits expressed more in males? Why can't males be carriers of a sex-linked trait?

13. List and Know for Test (these are in the PPT):
Autosomal Dominant Disorders (*one allele causes disorder):

Autosomal Recessive Disorders (*2 alleles cause disorder):

Sex-linked Recessive Disorders (females must have 2 alleles; males only have one):

14. What are the possible genotypes for the following phenotypic blood types?

Blood Type	Genotype
A	
B	
AB	
O	

15. Could a child with type O blood have a father with type AB blood? Why? Show the Punnett square.

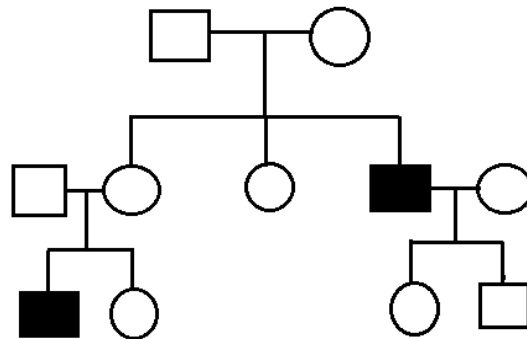
16. If a woman with type A blood had a child with a man that had type B blood, what are all the possible blood types that the child could have? Show the Punnett square. (There are multiple Punnett squares that could be made, but one particular Punnett square would show all the possible offspring).

17. What types of blood can the following individuals accept in a blood transfusion?

Blood Types:	Types they may receive:
A	
B	
AB	
O	

18. Why can't people with type O blood receive blood from anyone but other with type O?

Use the pedigree below to answer questions 18



19. Answer each of the following with regard to the pedigree above.

- Label the generations and individuals for the pedigree.
- Is the pedigree showing an autosomal or sex-linked trait? Explain.
- Is the pedigree showing a recessive or dominant trait? Explain.
- Write the genotype for each individual next to their symbol. If there is not enough information to determine the phenotype of an individual then put a? for the 2nd allele.
- Individual 1 in generation III mates with a female who is a carrier for colorblindness (hint: this helps give you the answer to b).
 - Draw this female into the pedigree.
 - Create a Punnett square predicting the offspring of these 2 individuals.
- What percentage of their offspring would be expected to be colorblind?

- iii. What percentage of their offspring would be expected to be colorblind?

21. Circle the multiple-choice answer for the following pedigree. Then answer the questions that follows.

The disorder is determined by 2 alleles at 1 locus.



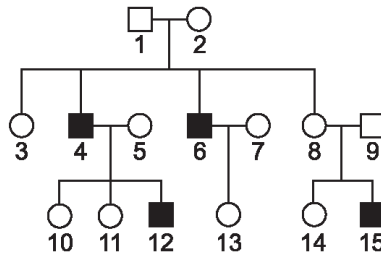
A. AA or Aa
B. AA
C. Aa
D. aa

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22. Circle the multiple-choice answer for the following pedigree. Then answer the questions that follows.

This pedigree shows 3 generations of a family and the family's incidences of color blindness, a sex-linked, recessive trait.

- male with normal vision
- female with normal vision
- male with color blindness
- female with color blindness



Which pair of females must have the same genotype?

- A. 3 and 5
- B. 7 and 11
- C. 8 and 13
- D. 10 and 14

- a. How could you tell that this pedigree was for a sex-linked trait instead even if the question hadn't told you?
- b. How could you tell that this pedigree was showing the inheritance of a recessive trait and not a dominant trait even if the question hadn't told you?

23. Genetic disorders occur when the number of chromosomes remains the same (46 for humans), but the ORDER OF THE DNA BASES creates health problems. Autosomal genetic disorders can be either dominant or recessive (see examples in PPT). What about sex-linked disorders...are they dominant or recessive? _____
Give three sex-linked disorders.

24. State the 3 Mendelian laws and explain what each one means.

25. What does polygenic mean? Be able to identify a graph on this (see the Genetics PPt on my blog)
26. Why is sickle cell anemia a good example of pleiotropy?
27. Why might genes on the same chromosome result in less variability in offspring than if they were on different chromosomes?
28. Go over the gene mapping problems done in class (rework them)
29. Be able to identify various karyotypes (see PPT). Ex- trisomy 21; Klinefelter's syndrome; Turner's Syndrome
30. Be able to distinguish between the different types of chromosomal mutations. Ex-inversion, translocation, nondisjunction, etc. *SEE PPT

***FYI- the term locus (singular) and loci (plural) are synonymous with the word 'location'*