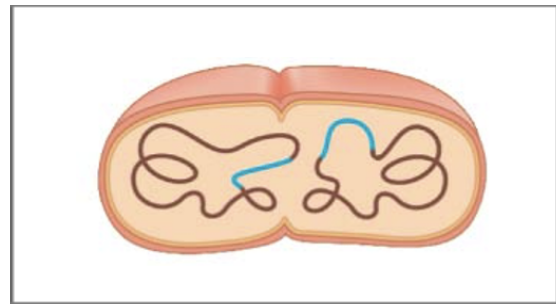
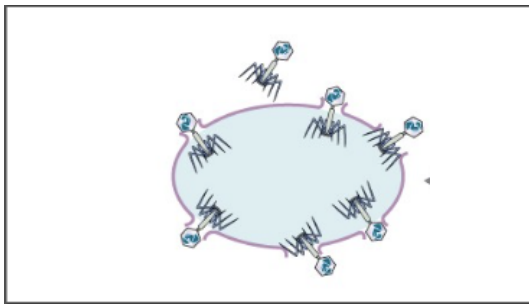


Review Questions for Exam 2

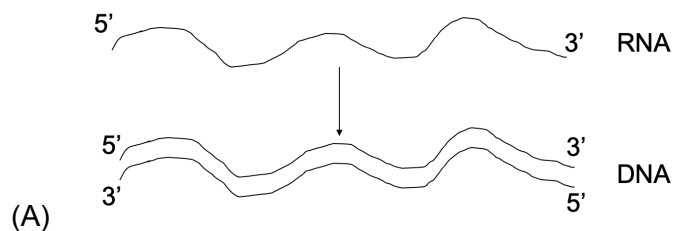
This review aims to provide practice with some of the more difficult concepts we have discussed in the class. It does not cover all topics we have covered, so please review Powerpoints and bring any/all questions to the review session.

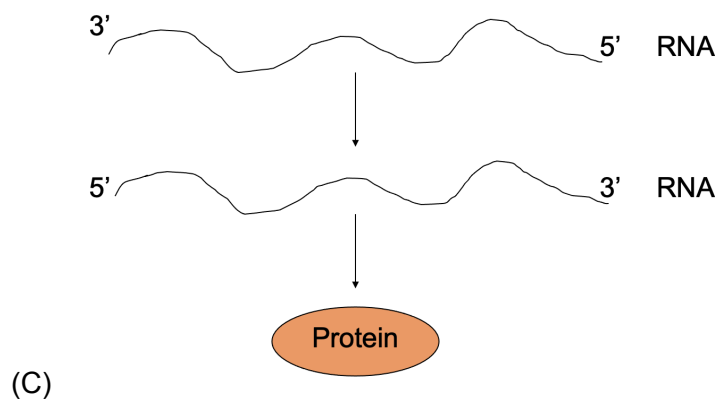
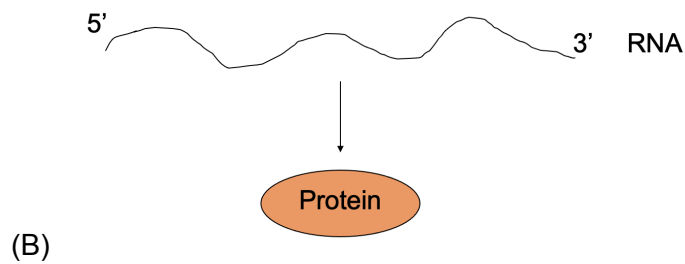
1. (A) Describe two differences between the lytic cycle and the lysogenic cycle.

(B) For each image below, indicate whether the phage is in the lytic cycle or the lysogenic cycle. Briefly explain your answer.



2. Label the following diagrams to indicate whether it depicts (+)RNA, (-)RNA, or reverse transcription.





3. Beside each stage of mitosis or meiosis listed below, note the DNA content present in the cell. As an example of how to do this: A haploid cell has 1X DNA content (one copy of each gene), and a diploid cell has 2X DNA content (two copies of each gene). After undergoing DNA replication, a diploid cell has 4X DNA content.

(A) Metaphase II of meiosis

(B) Prophase of mitosis

(C) After Telophase I of meiosis (i.e., in the daughter cells)

(D) After Telophase of mitosis (i.e., in the daughter cells)

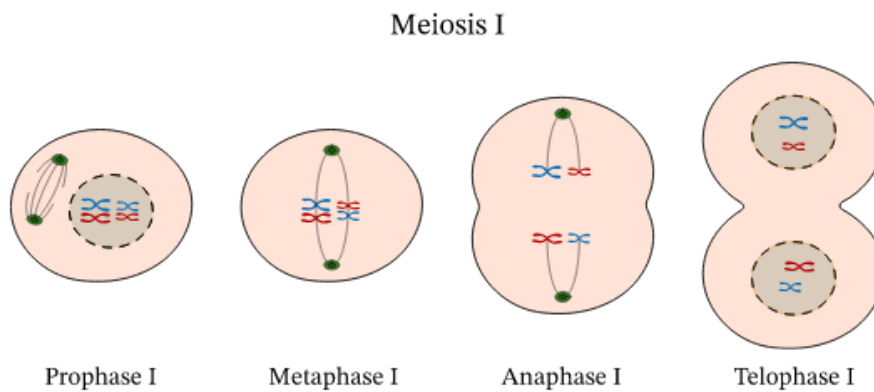
(E) Prophase I of meiosis

(F) Interphase of mitosis

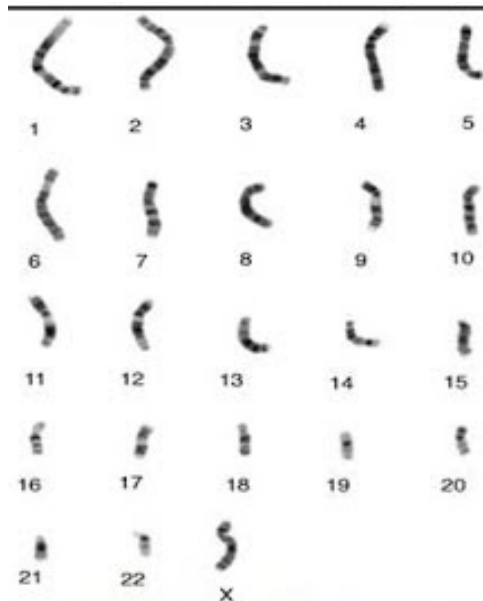
(G) After Telophase II of meiosis (i.e., in the daughter cells)

4. (A) What is the difference between homologous chromosomes and sister chromatids?

(B) Label at least one pair of homologous chromosomes and at least one pair of sister chromatids in the picture below.



5. The image below shows the chromosome content of a cell with chromosomes arranged in order of size (this is called a karyotype). Is this cell haploid or diploid? Explain your answer.



6. Fill in the table below contrasting mitosis and meiosis. For rows that refer to the products of meiosis, daughter cells, etc., assume that we are referring to Meiosis II.

	Mitosis	Meiosis
Number of daughter cells		
Number of cell divisions		
Daughter cells contain homologous chromosomes.		
Daughter cells are genetically identical to one another.		
Crossing over occurs.		

7. You go to the plant store and purchase two plants of the same species. One plant has pink flowers, and the other has white flowers. The florist tells you that they are “true-breeding,” meaning that they are homozygous for flower color. As a curious biologist, you would like to know whether the allele for pink flowers is dominant or recessive.

(A) Describe the test cross you would do to determine whether pink flowers are dominant to white flowers, or vice versa.

(B) Let’s say your test cross from part (A) shows that pink flowers are dominant to white flowers. If you were to cross two plants from the F1 generation in part (A), what results would you expect? Clearly indicate the genotypes and phenotypes of the parents and progeny, and show your work using a Punnett square.

8. Bill and Maggie are considering having a child, and, since you are a geneticist, they ask you about the probability that their child will have dark or light eyelashes. Bill has dark eyelashes, and Maggie has light eyelashes. You know that dark eyelashes are dominant to light eyelashes. What would you tell them?