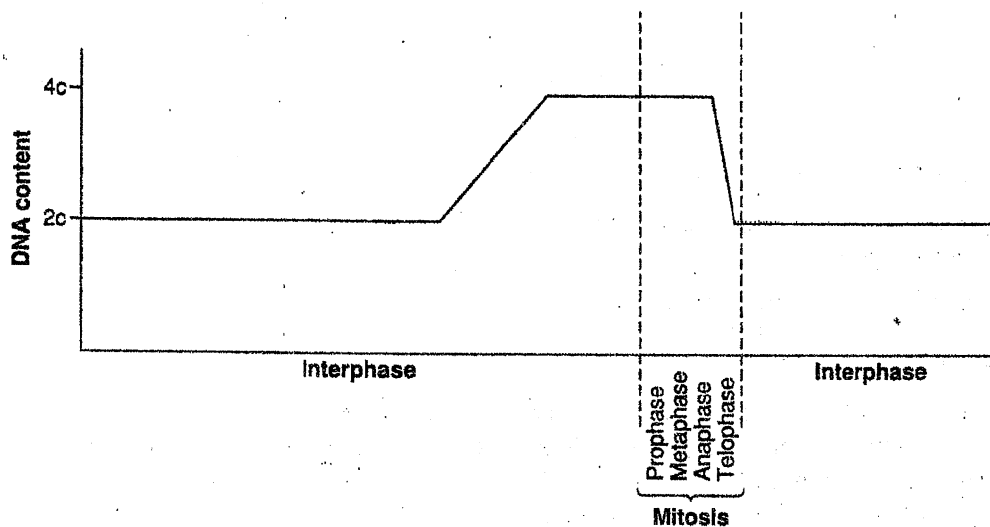


## Cell Reproduction

The amount of DNA in a diploid cell is represented by the symbol  $2c$ . As a cell replicates the DNA in its chromosomes, the DNA content rises from  $2c$  to  $4c$ . At the next mitotic division, the separation of the chromosomes returns the DNA content of the daughter cells to  $2c$ . This information is represented in the graph below. Study the graph and answer the questions that follow.



1. Draw an *X* on the graph to mark the point at which DNA content reaches  $3c$  during interphase.
2. Draw a *Y* on the graph to mark the point at which DNA content begins to decrease.
3. Draw a *Z* on the graph to mark the point where daughter cells begin a new cell cycle.

For each of the following questions, circle the letter that corresponds to the correct answer.

4. The DNA content of the cell represented in the graph changes
  - a. once.
  - b. twice.
  - c. three times.
  - d. four times.
5. Which of the following situations lasts for the longest time before the end of mitosis?
  - a. DNA content remains steady at  $4c$ .
  - b. DNA content increases from  $2c$  to  $4c$ .
  - c. DNA content decreases from  $4c$  to  $2c$ .
  - d. DNA content remains steady at  $2c$ .

6. Which of the following statements is correct?
- a. The decrease from 4c to 2c occurs more rapidly than the increase from 2c to 4c.
  - b. The decrease from 4c to 2c occurs more slowly than the increase from 2c to 4c.
  - c. The changes in *a* and *b* occur at the same rate.
  - d. The changes in *a* and *b* cannot be compared.
7. The DNA content increases
- a. throughout interphase.
  - b. at the beginning of interphase.
  - c. in the middle of interphase.
  - d. at the end of interphase.
8. The DNA content decreases
- a. throughout mitosis.
  - b. during prophase.
  - c. during metaphase.
  - d. from anaphase to telophase.
9. DNA content is at 4c during
- a. the end of interphase and the beginning of mitosis.
  - b. interphase.
  - c. mitosis.
  - d. the end of mitosis and the beginning of interphase.
10. The graph shows that DNA content falls to 1c
- a. when gametes are produced.
  - b. at no time during mitosis or interphase.
  - c. during the second half of meiosis.
  - d. during the second half of mitosis.
11. Which of the following statements most accurately describes the graph?
- a. The graph shows how a cell changes its activities as a result of changes in DNA content.
  - b. The graph shows why the DNA content of a cell changes.
  - c. The graph shows how the DNA content of a cell changes during interphase and mitosis.
  - d. The graph shows how DNA is replicated.
12. Why does DNA content increase during interphase? \_\_\_\_\_  
\_\_\_\_\_
13. Why does DNA content decrease during mitosis? \_\_\_\_\_  
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