

Name _____

Mitosis vs. Meiosis Questions

1) A cell with 10 pairs of chromosomes undergoes mitosis. How many chromosomes does each of the resulting cells have? Pick all correct answers.

- A. 2 pairs
- B. 5
- C. 5 pairs
- D. 10
- E. 10 pairs
- F. 20
- G. 20 pairs

Explain your choice(s):

2) A cell with 10 pairs of chromosomes undergoes meiosis. How many chromosomes does each of the resulting cells have? Pick all correct answers.

- A. 2 pairs
- B. 5
- C. 5 pairs
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- E. 10 pairs
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Explain your choice(s):

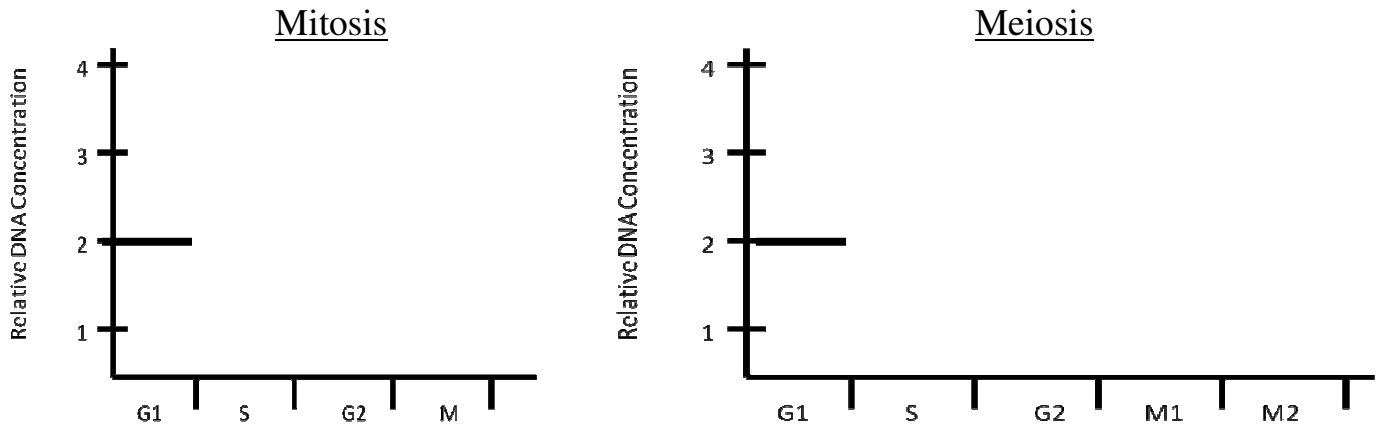
3) Phases of the mitotic cell cycle are listed below in alphabetical order. Starting with metaphase as #1, order the phases consecutively (2-7) in the spaces to the left.

- | | |
|-----------------|--|
| _____ Anaphase | |
| _____ G1-phase | |
| _____ G2-phase | |
| _____ Metaphase | |
| _____ Prophase | |
| _____ S-phase | |
| _____ Telophase | |

4) Below are nine statements that refer to one or more of the cell cycle phases. Match each statement to a phase of the mitotic cell cycle by writing the letter or letters in the spaces to the right of each phase listed above. If there is no adequate description for a particular phase, write one in. You will use all nine statements, some more than once.

- A. Nuclear membrane is intact throughout the duration of the phase.
- B. Nuclear membrane and nucleolus disappear.
- C. Environment is sensed for presence of adequate nutrients.
- D. Chromosomes are aligned on a plane.
- E. Sister chromatids begin the “walk” away from each other.
- F. Centrioles duplicate.
- G. Chromosomes replicate.
- H. Cyclin binds to a protein kinase to form MPF.
- I. Chromosomes begin to condense.

- 5) Fill in the two graphs below with a continuous line to indicate the relative DNA concentration of diploid cells during the mitotic and meiotic cell cycles.



- 6) Explain your reasoning for drawing the above graphs the way you did.

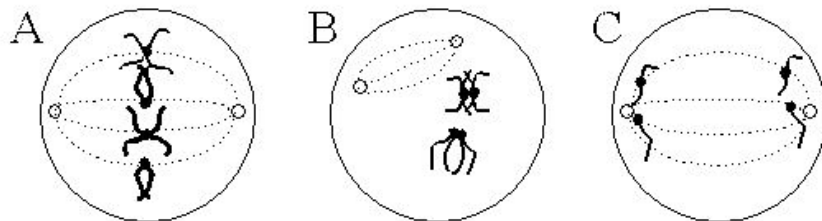
- 7) Consider the process of meiosis. Put the following events in order by numbering them 1-7. To the right of each event, write in the name of that phase based on the event/description.

- _____ Sister chromatids separate _____
- _____ Chromosomes line up as tetrads along equator of cell _____
- _____ Chromosomes (not tetrads) line up along equator of cell _____
- _____ DNA replicates _____
- _____ Homologous chromosomes pair _____
- _____ Cytokinesis produces haploid cells from a diploid cell _____
- _____ Homologous chromosomes separate _____

- 8) **True or False:** Two homologous chromosomes carry exactly the same genes.

- 9) **True or False:** The Chromosome Theory of Inheritance states that genes are chromosomes

- 10) Each of the cells shown below comes from the *same species*. Given this information, indicate below each cell whether it is undergoing mitosis, meiosis I or meiosis II, and then indicate which phase of the process the cell is in.



- 11) **True or False?** A normal somatic cell has 46 chromosomes (2n); a gamete has 23 (n). Explain.