Name: _____ Date: _____

Mitosis vs. Meiosis

Directions: Use the statements below to complete the chart.

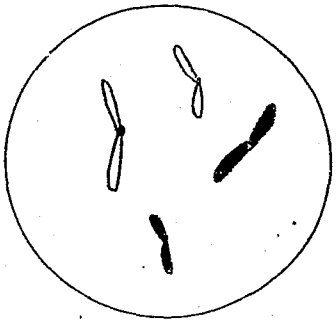
- Occurs in growth & repair
- Associated with sexual reproduction
- Daughter cell receives same number of chromosomes as parent cell
- Produces genetically identical cells
- Cell divides twice producing 4 daughter cells
- Occurs in production of gametes
- Cell divides once producing 2 daughter cells
- Cells produced are diploid (2n)
- Daughter cells contain only 1 chromosome from the homologous pair
- Daughter cell receives $\frac{1}{2}$ the number of chromosomes as parent cell
- Cells produced are haploid (1n)
- Associated with asexual reproduction

Mitosis	Meiosis

In the empty circle, draw one of the resulting daughter cells produced by the diploid cell at the end of:

- Mitosis
- Meiosis

2n



Mitosis

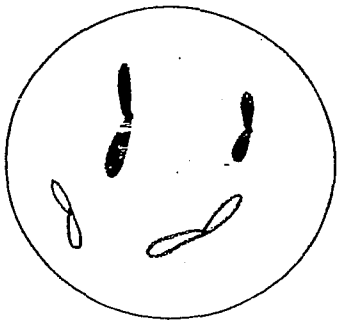
What is the chromosome number of the original cell? _____

What is the chromosome number of the daughter cell? _____

Is the daughter cell diploid or haploid? _____

Name an organ in which this cell might be found. _____

2n



Meiosis

What is the chromosome number of the original cell? _____

What is the chromosome number of the daughter cell? _____

Is the daughter cell diploid or haploid? _____

Name an organ in which this cell might be found. _____

COMPARING MITOSIS AND MEIOSIS

Name _____

Determine whether the following characteristics apply to mitosis, meiosis or both by putting a check in the appropriate column(s).

	Mitosis	Meiosis
1. no pairing of homologs occurs		
2. two divisions		
3. four daughter cells produced		
4. associated with growth and asexual reproduction		
5. associated with sexual reproduction		
6. one division		
7. two daughter cells produced		
8. involves duplication of chromosomes		
9. chromosome number is maintained		
10. chromosome number is halved		
11. crossing over between homologous chromosomes may occur		
12. daughter cells are identical to parent cell		
13. daughter cells are not identical to parent cell		
14. produces gametes		
15. synapsis occurs in prophase		

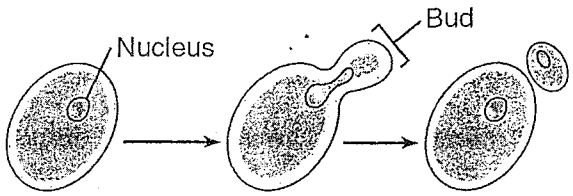
Comparison Chart

	Mitosis	Meiosis
In what types of cells does it occur?		
What type of reproduction is this process involved in?		
How many divisions occur?		
Number of daughter cells produced?		
Chromosome number of daughter cells produced?		
Genetic comparison with the original cell?		
Does crossing over occur?		

Mitosis Meiosis Practice

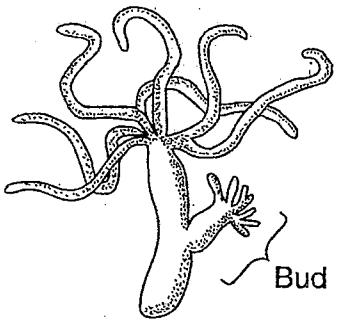
1. When a planarian (a type of worm) is cut in half, each half usually grows back into a complete worm over time. This situation most closely resembles
   1) asexual reproduction in which a mutation has occurred
   2) sexual reproduction in which each half represents one parent
   3) asexual reproduction of a single-celled organism
   4) sexual reproduction of a single-celled organism

2. The diagram below illustrates asexual reproduction in yeast.



   Yeast produce offspring that usually have
   1) genes that are different from those of the parent
   2) genes that are identical to those of the parent
   3) half of the genetic information of the parent
   4) organelles that are not found in the parent

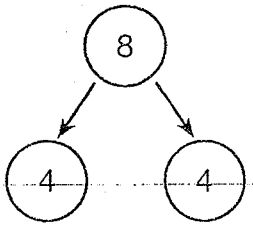
3. The bud shown in the diagram below was produced by asexual reproduction.



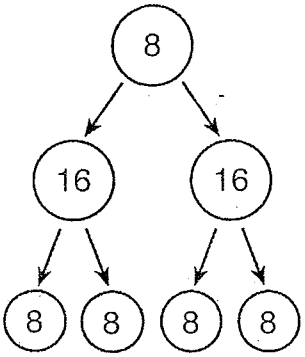
   Which process is responsible for the formation of the bud?
   1) fertilization
   2) recombination
   3) mitosis
   4) meiosis

4. The number in each circle below represents the chromosome number of the cell. Which diagram represents the production of offspring by an asexually reproducing organism

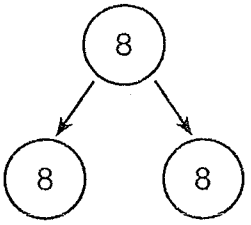
   1)



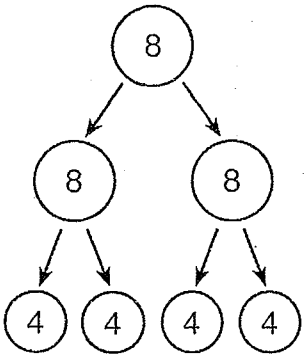
   2)



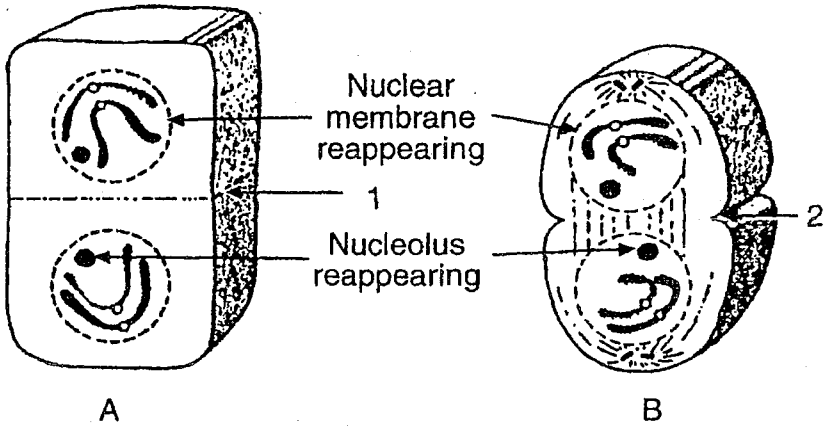
   3)



   4)



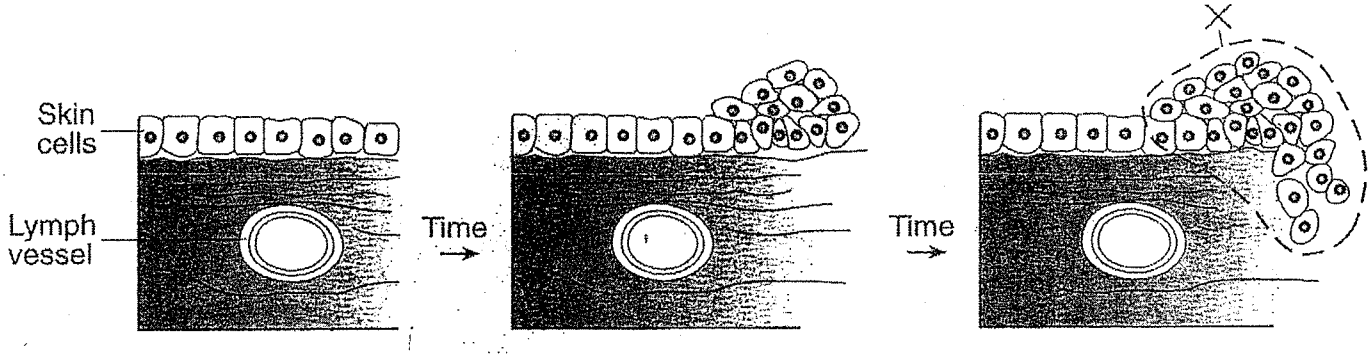
5. Diagrams *A* and *B* represent two cells in the final stage of cell division.



Which processes occur in regions 1 and 2 in these cells?

1) synthesis of a cell plate at 1, pinching in of the cell membrane at 2
2) pinching in of the cell membrane at 1, synthesis of a cell plate at 2
3) replication of a chromatid at 1, spindle apparatus joining the nuclear membrane with the cell membrane at 2
4) spindle apparatus joining the nuclear membrane with the cell membrane at 1, replication of a chromatid at 2

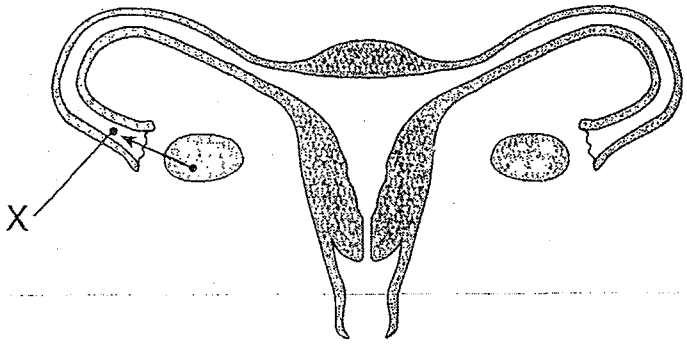
6. The diagram below shows the growth pattern of some skin cells in the human body after they have been exposed to ultraviolet radiation.



The cells in area X are most likely

1) red blood cells
2) cancer cells
3) white blood cells
4) sex cells

7. The diagram below represents structures found in a human female.



Which process results in the formation of structure X?

1) mitosis 2) meiosis 3) recombination 4) cloning

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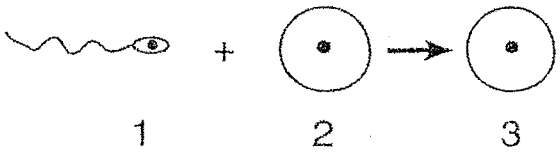
8. Some cells involved in the process of reproduction are represented in the diagram below



The process of meiosis formed

1) cell 1, only
2) cells 1 and 2
3) cell 3, only
4) cells 2 and 3

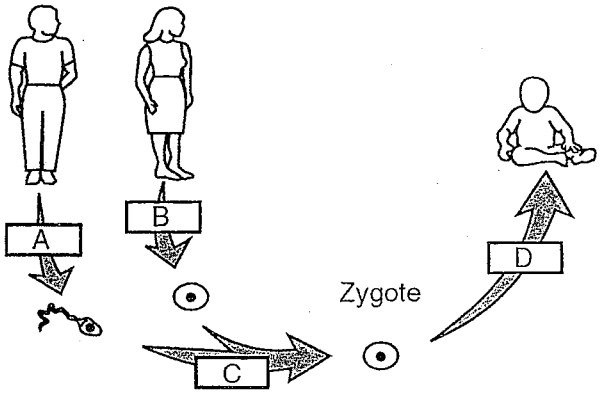
9. Which sequence represents the correct order of processes that result in the formation and development of an embryo?

1) meiosis →fertilization →mitosis
2) mitosis →fertilization →meiosis
3) fertilization →meiosis →mitosis
4) fertilization →mitosis →meiosis

10. Which statement correctly describes the genetic makeup of the sperm cells produced by a human male?

1) Each cell has pairs of chromosomes and the cells are usually genetically identical.
2) Each cell has pairs of chromosomes and the cells are usually genetically different.
3) Each cell has half the normal number of chromosomes and the cells are usually genetically identical.
4) Each cell has half the normal number of chromosomes and the cells are usually genetically different.

11. The diagram below represents processes involved in human reproduction.

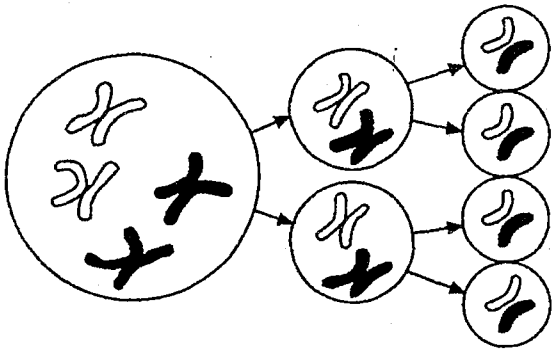


Row	A	B	C	D
(1)	mitosis	meiosis	fertilization	differentiation
(2)	meiosis	meiosis	fertilization	differentiation
(3)	meiosis	mitosis	differentiation	fertilization
(4)	mitosis	mitosis	differentiation	fertilization

Which row in the chart below correctly identifies the processes represented by the letters in the diagram?
1) 1 2) 2 3) 3 4) 4

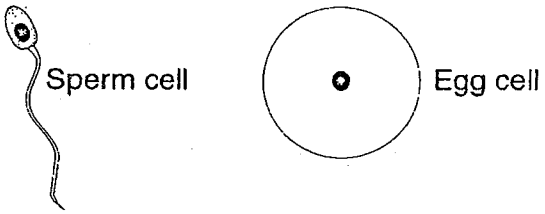
12. In human females, how many egg cells are formed as a result of one primary sex cell undergoing normal meiotic cell division?
1) 1 3) 3
2) 2 4) 4

13. The distribution of chromosomes in one type of cell division is shown in the diagram below.



Which process is represented in the diagram?
1) asexual reproduction
2) meiosis
3) mitosis
4) vegetative propagation

14. The diagram below represents two human cells.

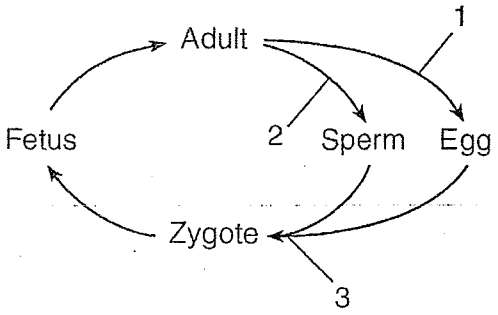


These cells are a direct result of
1) mitotic cell division 3) fertilization
2) sex linkage 4) gametogenesis

15. A dogfish shark contains 24 chromosomes in each of its muscle cells. How many chromosomes are normally found in each of its gametes?
1) 6 3) 24
2) 12 4) 48

Base your answers to questions **16** and **17** on the information below and on your knowledge of biology.

The diagram below represents some stages in the life cycle of humans. The numbers in the diagram represent various processes in the cycle.



16. State how process 3 affects the amount of genetic information on offspring receives.

17. State how processes 1 and 2 affect the amount of genetic information provided by a parent to its offspring.