**Mitosis and Meiosis**

**Name:** _____ **Date:** _____

1. Jack bought a small turtle. Three months later, the turtle had grown to twice its original size. Which of the following statements *best* describes why Jack's turtle got bigger?

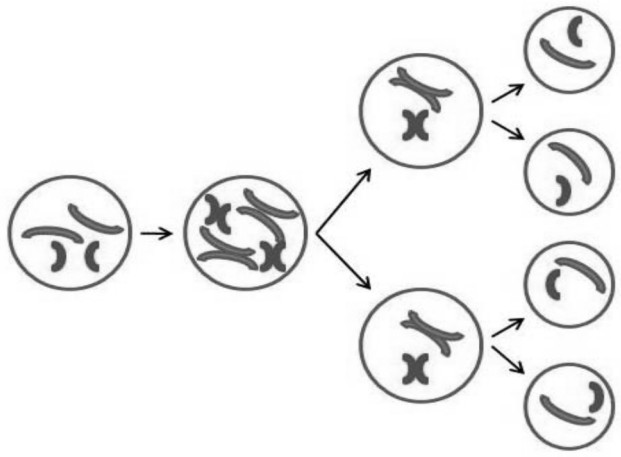
   A. Parts of the turtle stretched out as it grew larger.

   B. The number of cells in the turtle's body increased.

   C. The turtle's body absorbed the food it ate and water it drank.

   D. The size of each cell in the turtle's body got bigger as it got older.

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



   Which process and type of resulting cells are represented in the diagram?

   A. mitosis, which produces gametes

   B. mitosis, which produces body cells

   C. meiosis, which produces gametes

   D. meiosis, which produces body cells

3. Which of the following cell types is formed by meiosis?

A. muscle cells B. sperm cells C. skin cells D. blood cells

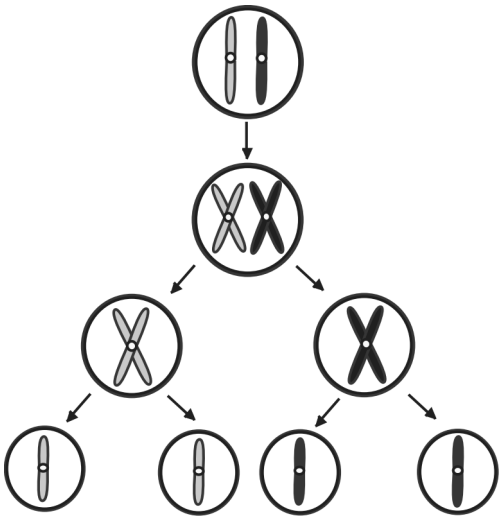
4. Which of the following produces identical nuclei in cells?

A. pollination B. mitosis C. osmosis D. fertilization

5. What process is necessary for the inherited traits of an organism to be passed along by sexual reproduction?

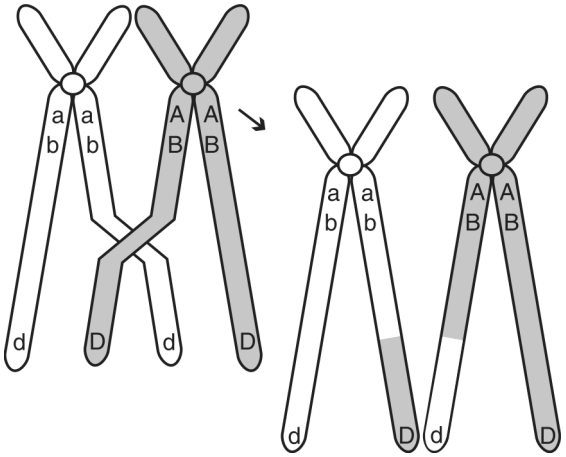
A. mitosis B. meiosis C. mutation D. fission

6. The diagram below shows a cellular process that occurs in organisms.



This process is known as

A. meiosis.
B. mitosis.
C. endocytosis.
D. phagocytosis.

7. 


The diagram above shows homologous chromosomes during prophase I of meiosis. Which of the following correctly describes the process being illustrated?

A. mutation in which the DNA content of the gene is altered

B. segregation of sister chromatids

C. condensation and segregation of alleles

D. crossing-over in which alleles are exchanged

8. Which of the following sequences represents chromosome number during fertilization?

A. $n + n \rightarrow 2n$ B. $2n \rightarrow n + n$ C. $n \rightarrow n$ D. $2n \rightarrow 2n$

9. Which of the following *best* describes meiosis?

A. It is carried out in all tissues that require cell replacement.

B. It occurs only in cells in the reproductive structures of the organism.

C. It happens in all tissues except the brain and spinal cord.

D. It is the first stage of mitosis.

10. Based only on the sex chromosomes in typical human egg and sperm cells at fertilization, the probability of producing a female is

A. 25%. B. 50%. C. 75%. D. 90%.

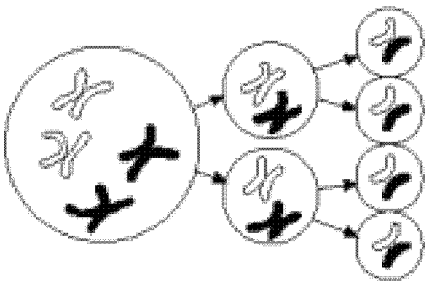
11. Mendel hypothesized that reproductive cells have only one factor for each inherited trait. This hypothesis is supported by the observation that

A. haploid cells are produced by mitosis.
B. diploid cells are produced by mitosis.
C. haploid cells are produced by meiosis.
D. diploid cells are produced by meiosis.

12. If an intestinal cell in a butterfly contains 24 chromosomes, a butterfly egg cell would contain

A. 3 chromosomes. B. 6 chromosomes. C. 12 chromosomes. D. 24 chromosomes.

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



Which process is represented in the diagram?

A. asexual reproduction B. mitosis C. meiosis D. vegetative propagation

14. Body cells of fruit flies contain only 8 chromosomes, compared to human cells that contain 46. Scientists used studies of fruit flies to discover how egg and sperm cells (gametes) are formed. What did they observe?

A. Body cells of the offspring flies had 16 chromosomes.

B. Sperm cells from the male had 8 chromosomes.

C. Egg cells from the female had 4 chromosomes.

D. Body cells of the offspring flies had 4 chromosomes.

15. A scientist conducted a study of an organism and found that its body cells contained 40 chromosomes. These cells were cultured in the laboratory, and cell division was observed. What difference, if any, would the scientist expect to observe between body cell division and sex cell division in the organism?

A. Body cells divide by mitosis, and sex cells divide by meiosis.

B. Body cells divide by meiosis, and sex cells divide by mitosis.

C. There is no difference; body cells and sex cells both divide by mitosis.

D. There is no difference; body cells and sex cells both divide by meiosis.

16. What is one advantage of sexual reproduction?

A. The offspring are identical to the parents

B. The offspring are resistant to viruses.

C. The offspring are born live, rather than from eggs.

D. The offspring inherit a wider variety of genetic information.

17. In humans, sex cells are produced by a different process than other body cells.

How is the process used to produce sex cells different from the process used to produce body cells?

A. Only the process used to make sex cells uses spindle fibers,

B. Only the process used to make sex cells produces haploid cells.

C. Only the process used to make sex cells can result in mutations.

D. Only the process used to make sex cells requires DNA replication.

18. A male shark has 40 chromosomes in each of its sex cells.

How many chromosomes would be present in a normal body cell of a shark?

A. 20 B. 40 C. 80 D. 160

19. The diagram shows a cellular process.

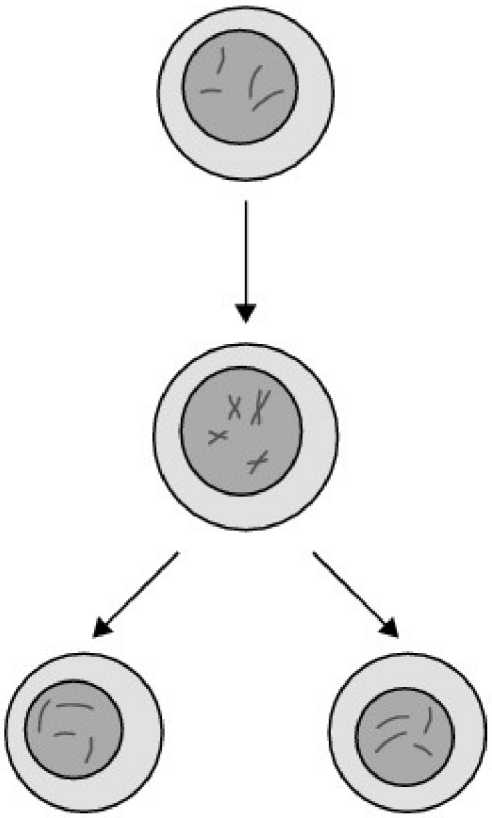
How is this process used in the bodies of male animals?

A. To produce sperm cells

B. To produce DNA sequences

C. To produce white blood cells

D. To produce digestive enzymes



20. Trisomy 21 is a genetic disorder in which an individual has an extra copy of chromosome 21?

Which process could cause trisomy 21?

A. Failure of a chromosome to replicate during mitosis

B. Failure of chromosome pairs to join during fertilization

C. Failure of a chromosome to cross over during replication

D. Failure of chromosome pairs to separate properly during meiosis

21. What is a difference between mitosis and meiosis?

A. Mitosis occurs in all the cells in animals and plants, while meiosis occurs in only in bacteria.

B. In mitosis, the products are identical to the parent cell, while in meiosis the products are different from the parent cell.

C. In mitosis, one cell divides into two cells, while in meiosis two cells combine to make one cell.

D. Mitosis involves separating the chromosomes, while meiosis involves only the cytoplasm of the cell.

22. *Spirogyra* are green algae that can reproduce sexually. Which of the following features identifi es reproduction in *Spirogyra* as sexual reproduction?

A. The cells of parent algae have nuclei.

B. Each offspring contains chloroplasts.

C. Several offspring may be produced at once.

D. Genetic material is contributed by two parent cells.

23. Which of the following is the *primary* advantage of sexual reproduction when compared to asexual reproduction?

A. There is a greater number of offspring.

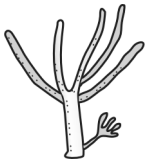
B. There is more food available to offspring.

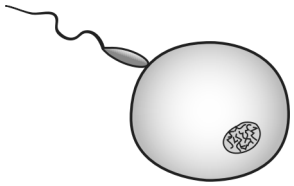
C. There is greater genetic variety in offspring.

D. There is a longer development time for offspring.

24. The diagrams below represent forms of reproduction. In which form of reproduction will the offspring differ most from the parent?

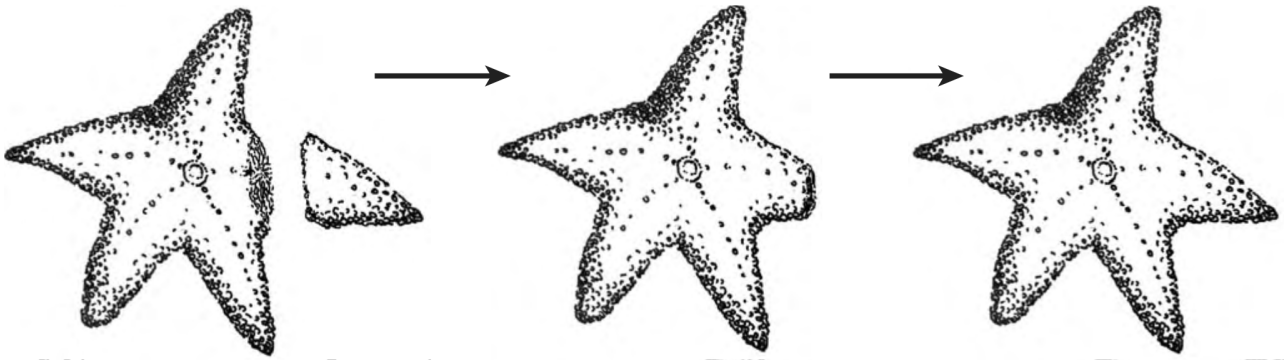
A. 

B. 

C. 

D. 

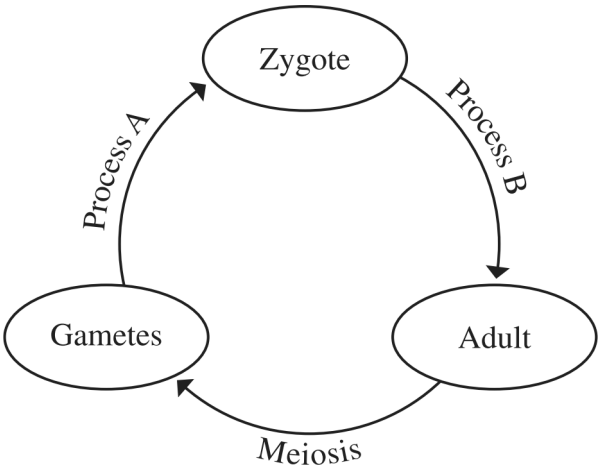
25. The diagram below shows a sea star in various stages of regeneration.



What cellular process is *directly* responsible for this regeneration?

A. meiosis B. mitosis C. transpiration D. respiration

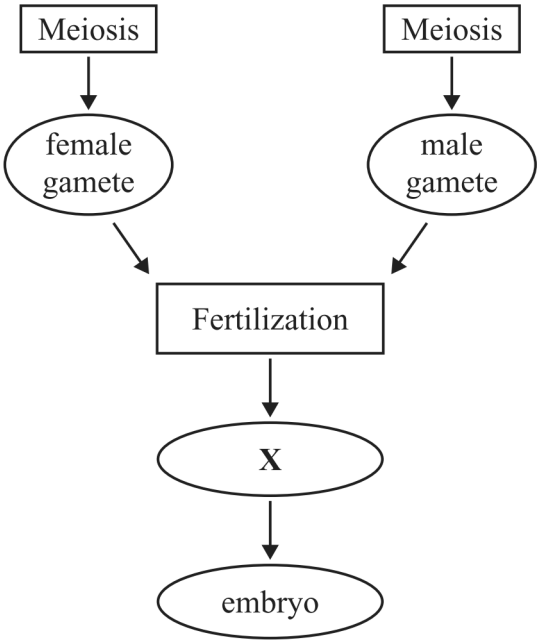
26. The diagram below shows a generalized cycle in sexually reproducing animals.




What is Process A in this cycle?

A. fertilization B. mitosis C. osmosis D. replication

27. A partial diagram of a reproductive process is shown below.




Which of the following labels belongs in the oval marked *X*?

A. egg B. fetus C. sperm D. zygote

28. Which of the following *best* describes the formation of a zygote?

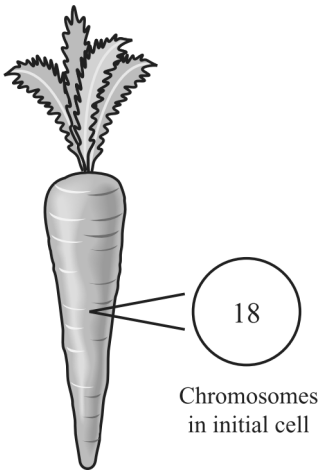
A. A sperm cell nucleus and an egg cell nucleus fuse.

B. A cell's DNA replication and mitosis are accelerated.

C. A succession of cell divisions produces a solid mass of cells.

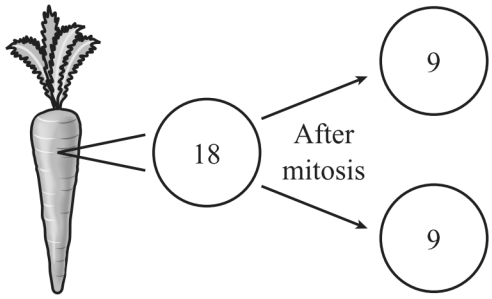
D. A cell with 46 chromosomes divides to form cells with 23 chromosomes each.

29. The diagram below provides information about a carrot cell.

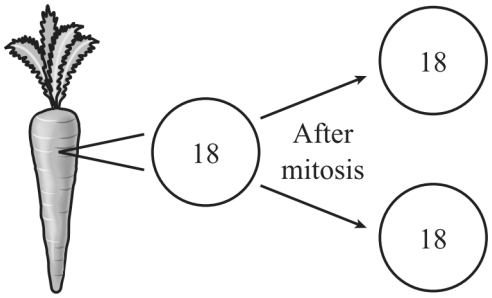



A carrot cell contains 18 chromosomes. Which of the following diagrams illustrates the correct number of chromosomes in new cells produced by mitosis?

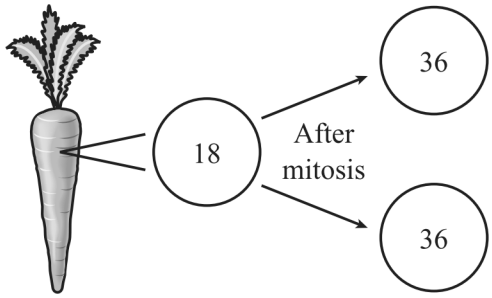
A.



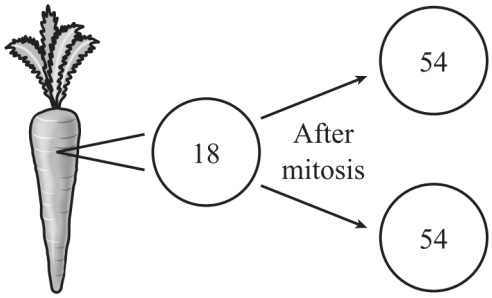

B.



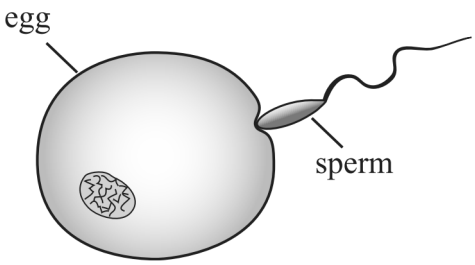

C.




D.



30. The figure below shows an egg cell and a sperm cell.




Which of the following is represented by this figure?

A. the formation of a zygote
B. mitotic division of nuclei
C. the production of gametes
D. translation of genetic information

31. In the synthesis phase (*S* phase) of the cell cycle, a body cell copies its DNA. This DNA replication occurs in preparation for which of the following processes?

A. cellular respiration
B. facilitated diffusion
C. mitosis
D. translation

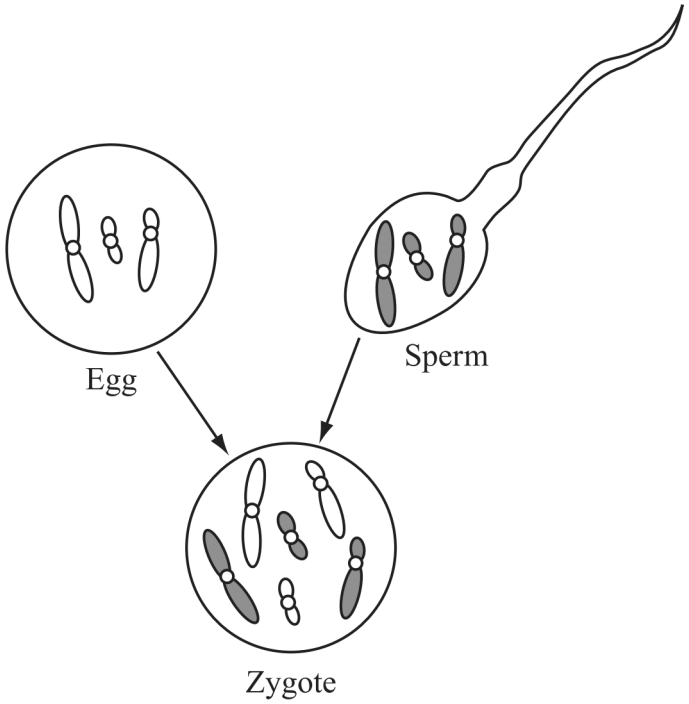
32. The fungus *Penicillium* reproduces asexually and forms genetically identical spores. Which of the following processes does *Penicillium* use to form its spores?

A. fertilization
B. mitosis
C. osmosis
D. transcription

33. Which type of cell must contain a mutation in order for the mutation to be passed from a woman to her offspring?

A. blood cell
B. brain cell
C. egg cell
D. skin cell

34. A biological process is represented in the diagram below.




(Not to scale)

Which of the following concepts is *best* illustrated by the diagram?

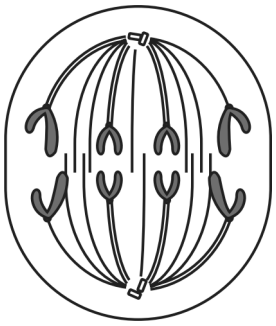
A. Crossing-over creates new genetic diversity in gametes.

B. Mitosis increases the number of chromosomes in zygote cells.

C. In asexual reproduction, the offspring produced are genetically identical to the parent.

D. In sexual reproduction, the offspring receive the same number of chromosomes from each parent.

35. The illustration below shows a phase of mitosis



Which of the following statements describes what is occurring in this phase?

A. The chromosomes are duplicating their DNA.

B. The copies of each chromosome are separating.

C. The chromosomes are moving toward the center of the cell.

D. The homologous chromosomes are preparing for crossing over.