

Self-test: Cell Division and Genetics (CH 10, 11, 14.1, 14.2)**Completion**

Complete each statement.

1. Following replication of its DNA, each chromosome contains two _____, which are attached to each other by a centromere.
2. Chromosomes that are not involved in sex determination are called _____.
3. A picture of a cell's chromosomes is called a(n) _____.
4. _____ is the process by which bacteria split asexually into two identical organisms.
5. In bacteria, cell division takes place in two stages. First the _____ is copied, and then the cell splits.
6. The sequence of events that occurs in a cell from one mitotic division to the next is called the _____.
7. Collectively, the time spent in $G_1 + S + G_2$ is called _____.
8. In mitosis, anaphase follows _____.
9. Chromosomes coil up into short rods during _____.
10. During cell division, plant cells form a new _____ in the center of the cell.
11. The stage of meiosis during which homologues line up along the equator of the cell is called _____.
12. The process called _____ guarantees that the number of chromosomes in gametes is half the number of chromosomes in body cells.
13. A reciprocal exchange of corresponding segments of DNA on sister homologous chromosomes is called _____.
14. The cells resulting from meiosis in either males or females are called _____.
15. As a result of spermatogenesis, four cells are produced that can all develop into sperm cells. As a result of oogenesis, only _____ cell(s) develop(s) into (an) egg cell(s).
16. Cancer occurs as a result of disorders in cell _____.
17. A reproductive process in which fertilization occurs within a single plant is called _____.
18. The transferring of pollen between plants is called _____.
19. Mendel produced true-breeding strains of pea plants through the process of _____.
20. When two members of the F_1 generation are allowed to breed with each other, the offspring are referred to as the _____ generation.
21. Mendel called the offspring of the P generation the first filial generation, or the _____ generation.
22. In heterozygous individuals, only the _____ allele achieves expression.

23. A trait that is not expressed in the F₁ generation resulting from the crossbreeding of two genetically different, true-breeding organisms is called _____.
24. The principle that states that one factor may mask the effect of another factor is the principle of _____.
25. In Mendel's experiments, a trait that disappeared in the F₁ generation but reappeared in the F₂ generation was always a _____.
26. The statement that the members of each pair of alleles separate when gametes are formed is known as the _____.
27. Different forms of a particular gene, which Mendel called *factors*, are now called _____.
28. The cellular process that results in the segregation of Mendel's factors is _____.
29. The portion of a DNA molecule containing the coded instructions that result in a particular characteristic of an organism is called a(n) _____.
30. An organism that has two identical alleles for a trait is called _____.
31. An organism's _____ refers to the set of alleles it has inherited.
32. The appearance of an organism as a result of its genotype is its _____.
33. The likelihood that a specific event will occur is called _____.

34.

RRYy x RrYy

	RY	Ry	Ry	
Ry	X			
rY				
ry				

Pea plants

R = round seed
 r = wrinkled seed
 Y = yellow seed
 y = green seed

Refer to the illustration above. The box labeled "X" represents the phenotype _____.

35. A fractional probability of 1/2 is the same as a decimal probability of _____.

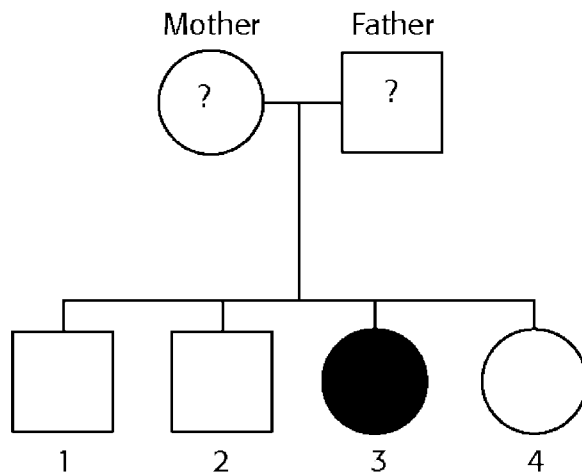
In pea plants, tallness (T) is dominant over shortness (t). Crosses between plants with these traits can be analyzed using a Punnett square similar to the one shown below.

	T	t
T	1	2
t	3	4

36. Refer to the illustration above. The parents shown in the Punnett square are likely to have offspring with a genotype ratio of _____.
37. Refer to the illustration above. Box 2 and box _____ in the Punnett square represent plants that would be heterozygous for tallness.
38. Refer to the illustration above. The phenotype of the plant that would be represented in box 4 of the Punnett square would be _____.
39. Refer to the illustration above. The genotype of both parents shown in the Punnett square above is _____.
40. A situation in which both alleles for a trait are expressed in a heterozygous offspring is called _____.
41. A pattern of heredity in which a heterozygous individual has a phenotype that is intermediate between the phenotypes of its two homozygous parents is called _____.
42. A table used to determine and diagram the results of a genetic cross is called a _____.
43. In genetics, lowercase letters are usually used to indicate _____.
44. A cross involving two pairs of contrasting traits is a(n) _____ cross.
45. The X and Y chromosomes are called the _____ chromosomes.
46. In humans, the genotype XX results in a(n) _____.
47. Linked genes can be separated from each other in meiosis if _____ occurs.
48. When traits do not appear according to the expected ratio in offspring, _____ may have occurred.
49. Spontaneous changes in genetic material are called _____.
50. Identifying patterns of inheritance within a family over several generations is possible by studying a diagram called a(n) _____.
51. A person who is heterozygous for a recessive disorder is called a(n) _____.
52. By studying a(n) _____, genetic counselors can study how a trait was inherited over several generations.

53. A genetic disorder resulting in defective blood clotting is _____.
54. Phenylketonuria (PKU) is a genetic disease in which an individual lacks a(n) _____ responsible for converting the amino acid phenylalanine into the amino acid tyrosine.
55. A trait that is determined by a gene found only on the X chromosome is said to be _____.
56. In humans, the genetic disorder caused by an extra chromosome 21 is called _____.
57. The failure of replicated chromosomes to separate is called _____.

The partially completed pedigree below is for a family with a genetic disorder.



58. Refer to the illustration above. The father listed in the pedigree is most likely _____ for the trait.

Essay

59. What would happen if the chromosome number were not reduced before sexual reproduction? Write your answer in the space below.
60. Compare the features of mitotic metaphase, meiotic metaphase I, and meiotic metaphase II. Write your answer in the space below.
61. A great deal of research on the causes of and a possible cure for cancer focuses on mitosis. Why? Write your answer in the space below.
62. How might you go about determining the genotype of a red-flowering plant where red is dominant over white? Write your answer in the space below.
63. All of the offspring resulting from a cross between a red snapdragon and a white snapdragon are pink. What is a possible explanation for this? Write your answer in the space below.
64. Explain why crossing-over is an important source of genetic variation. Write your answer in the space below.
65. Discuss the inheritance pattern that would be seen in a pedigree designed to study a recessive sex-linked trait. Write your answer in the space below.