Your next exam in Biol 178 will be on Wednesday, October 29, 2008. This study guide for the exam has three sections: I. Mitosis, II. Meiosis and III. Mendelian Genetics. Use this study guide, the Powerpoint uploads, your class notes and your text to prepare for the exam. Good luck!

I. Mitosis

13. Eukaryotic chromosomes are composed of a complex of 60% protein and 40% DNA. The protein component of a chromosome is called
A. histone.
B. chromatin.
C. histamine complex.
D. chromatid.
E. centromere.

14. If a eukaryotic cell has a single set of chromosomes, it is
A. haploid.
B. diploid.
C. polyploid.

15. The physical map of the array of chromosomes is called a(n)
A. ecotype.
B. haplotype.
C. karyotype.
D. phenotype.
E. genotype.

16. The physical distribution of cytoplasmic material into the two daughter cells is called
A. DNA replication.
B. mitosis.
C. cytokinesis.
D. binary fission.

17. Which of the following cell functions is maintained by mitosis and cytokinesis in eukaryotes?
A. growth and reproduction
B. repair
C. replacement of old cells
D. more than one answer is correct

18. The bacterial genome exist as a
A. single, circular, protein-coated, double stranded DNA molecule.
B. single, circular, uncoated, double stranded DNA molecule.
C. single, circular, uncoated, double stranded RNA molecule.
D. single, linear, uncoated, double stranded DNA molecule.
E. many, circular, uncoated, double stranded DNA molecules.

20. The number of chromosomes characteristic of eukaryotes, in general,
A. can usually be determined without the use of a microscope.
B. can usually be predicted from the size of the organism.
C. change as the organisms grow and age.
D. varies considerably from 2 to over 1000 in different species.
E. varies depending on the type of the cell in the same organism.
21. Eukaryotic chromosomes are coated with proteins containing a high proportion of basic amino acids. These proteins are given the name
   A. albumins.
   B. antibodies.
   C. enzymes.
   D. histamines.
   E. histones.

23a. In the human species, cells contain two sets of chromosomes totaling
   A. 2.
   B. 22.
   C. 44.
   D. 46.
   E. 23.

23b. In the human, the body or somatic (non-sex) cells contain two sets of chromosomes totaling
   A. 2.
   B. 22.
   C. 44.
   D. 46.
   E. 23.

24. The two copies of each chromosome in body cells are called
   A. chromatids.
   B. homologous chromosomes.
   C. sister chromosomes.
   D. daughter chromosomes.
   E. genes.

25. Before cell division of the body cells, each homologue replicates into two parts. These parts are connected by a centromere and are called
   A. sister chromatids.
   B. daughter chromatids.
   C. sister chromosomes.
   D. daughter chromosomes.
   E. genes.

26. Which of the following sequence of cell-cycle phases is characteristic of eukaryotes?
   A. G to S to M
   B. G₁ to S to G₂ to M to C
   C. S to M to C
   D. G₁ to G₂ to S to C
   E. G₁ to G₂ to G₃ to S to C

27. The primary growth phase of a cell is
   A. G₁.
   B. S.
   C. G₂.
   D. M.
   E. C.
28. The phase of the cell cycle during which the cytoplasm divides to form two cells is
   A. G1.
   B. S.
   C. M.
   D. C.
   E. G2.

29. The cell organelles replicate prior to genomic separation in ______ phase.
   A. G1
   B. S
   C. G2
   D. M
   E. C

30. The first stage of mitosis, when the chromosomes become visibly shorter and thicker is
   A. anaphase.
   B. interphase.
   C. metaphase.
   D. prophase.
   E. telophase.

31. In prophase, ribosomal RNA synthesis stops when the chromosomes condense, and this makes the
   A. chromosomes lengthen.
   B. nuclear envelope reform.
   C. nucleolus disappear.
   D. chromosomes line up at the equator.

32. The chromosomes line up at the equator of the spindle during
   A. anaphase.
   B. interphase.
   C. metaphase.
   D. prophase.
   E. telophase.

33. The framework of microtubules that appears in cell division which eventually moves the chromatids
    apart is called the
   A. aster.
   B. cell plate.
   C. centriole.
   D. spindle apparatus.
   E. centromere.

34. Which one of the following represents interphase?
   A. G1 + G2 + S
   B. S + M + C
   C. prophase + metaphase + anaphase + telophase
   D. cytokinesis + mitosis
   E. G0 + G1 + G2
35. The attachment of which molecules is critical for the proper separation of sister chromatids?
A. chromosomes
B. asters
C. microtubules
D. cyclins
E. protein kinases

36. Microtubules become shorter, pulling chromatids to the ends of the spindle, during
A. anaphase.
B. interphase.
C. metaphase.
D. prophase.
E. telophase.

37. Which of the following is essentially the reverse of prophase?
A. anaphase
B. interphase
C. metaphase
D. telophase
E. cytokinesis

38. Animal cells typically achieve cytokinesis by
A. binary fission.
B. forming a cell plate across the middle of the cell.
C. forming a cleavage furrow that pinches the cell into two.
D. chromosome condensation.
E. chromosome elongation.

39. Plant cells typically achieve cytokinesis by
A. binary fission.
B. forming a cell plate across the middle of the cell.
C. forming a cleavage furrow that pinches the cell into two.
D. chromosome condensation.
E. chromosome elongation.

41. The proteins that participate in the functioning of the checkpoints for cell cycle control are
A. microtubules.
B. asters.
C. histones.
D. cyclins and cyclin-dependent kinases.
E. channel proteins.

43. The process of nuclear division in eukaryotic cells resulting in the formation of two cloned, genetically identical cells is called
A. meiosis.
B. mitosis.
C. binary fission.
D. cytokinesis.
44. The process of cell division in prokaryotic cells is called
   A. meiosis.
   B. mitosis.
   C. binary fission.
   D. cytokinesis.

46. A scientist wants to study histones. Histones are
   A. proteins that are tightly bound to the double strands of DNA.
   B. proteins that are tightly bound with only one of the strands of DNA.
   C. proteins that are tightly bound to mRNA.
   D. proteins that serve as spindle fiber to pull the sister chromatids apart during anaphase.
   E. proteins that are tightly bound to inside of the nuclear membrane.

47. Nucleosomes are located in the
   A. nucleus attached to the ends of DNA strands.
   B. nucleus and are composed of DNA and histones.
   C. nucleus and are associated with the nuclear membrane.
   D. nucleus and are composed of mRNA and histones.
   E. nucleus and are associated with the nucleolus and aid in ribosome synthesis.

48. A cell biologist is conducting a karyotype procedure on alligator red blood cells. Exactly what does this mean?
   A. It means that red blood cells from the alligator will be examined with a microscope and the nuclei will be counted.
   B. It means that red blood cells from the alligator will be examined using restriction enzymes to count the number of centromeres that are present on the chromosomes.
   C. It means that chromosomes from the red blood cells of the alligator will be examined with a microscope, photographed, counted, lined up with their respective homologous partner, and displayed.
   D. It means that chromosomes from the red blood cells of the alligator will be examined with a microscope to determine the amount of hemoglobin present.

49. In humans the diploid number of chromosomes is 46. The haploid number is 23. Prior to mitosis in the cell cycle, the cell is in the G2 phase. Which of the statements is true?
   A. The homologous chromosomes are lined up on the equator.
   B. The homologous chromosomes have all been copied through DNA replication and are now sister chromatids.
   C. The homologous chromosomes have been pulled to their respective poles by the spindle apparatus.
   D. The homologous chromosomes have not been replicated yet.
   E. The homologous chromosomes are now in the haploid or n condition.

50. Following S phase, a human cell would have how many pairs of sister chromatids and individual DNA molecules?
   A. 23 pairs of sister chromatids and 46 individual DNA molecules
   B. 23 pairs of sister chromatids and 92 individual DNA molecules
   C. 46 pairs of sister chromatids and 46 individual DNA molecules
   D. 46 pairs of sister chromatids and 92 individual DNA molecules
   E. 46 pairs of sister chromatids and 184 individual DNA molecules
51. Cytokinesis occurs right after  
A. prophase.  
B. G1.  
C. G2.  
D. anaphase.  
E. telophase.

52. All of the following phases occur during interphase of the cell cycle except  
A. G1.  
B. S.  
C. G2.  
D. M.

53. If a cell has 32 chromosomes prior to S and undergoes mitosis followed by cytokinesis, each new daughter cell will have how many chromosomes?  
A. 64  
B. 32  
C. 16  
D. 8

69. While dissecting a cat in anatomy class, you tease out some muscle tissue, stain it, and look at it under a light microscope. What percentage of the muscle cells would you expect to be in M phase at any given time?  
A. 0%  
B. 25%  
C. 50%  
D. 100%

**Meiosis**

10. The fusion of male gamete cells with female gamete cells is called  
A. syngamy.  
B. meiosis.  
C. mitosis.  
D. recombination.  
E. synapsis.

11. Diploid organisms use meiosis for the development of gametes. Meiosis consists of how many rounds of nuclear division?  
A. one  
B. two  
C. three  
D. four  
E. none of these

12. The pairing of chromosomes along their lengths which is essential for crossing over is referred to as  
A. syngamy.  
B. synapsis.  
C. prophase.  
D. recombination.  
E. centromere.
13. The cell produced by the fusion of an egg and a sperm is the
   A. gamete.
   B. haploid.
   C. zygote.
   D. germ line cell.
   E. somatic cell.

14. The zygote has
   A. one copy of each chromosome.
   B. one full haploid complement of chromosomes.
   C. chromosomes identical to those of a sperm cell.
   D. chromosomes identical to those of an egg cell.
   E. two copies of each chromosome.

15. The reduction division that separates two haploid complements from each other is called
   A. mitosis.
   B. meiosis.
   C. syngamy.
   D. haploid division.
   E. binary fission.

16. All of the following animal cells are diploid except
   A. gametic.
   B. muscles.
   C. nerves.
   D. skin.
   E. reproductive organ.

17. The point of connection between the two sister chromatids before anaphase of mitosis separates them
   is called the
   A. homologue.
   B. kinetochore.
   C. centromere.
   D. microtubule complex.
   E. synapsis.

18. Which of the following produces identical cells?
   A. meiosis
   B. mitosis
   C. gamete formation
   D. syngamy
   E. fertilization

20. In one of the first steps in meiosis, the
   A. clearly defined spindle apparatus appears in the center of the cell.
   B. chromatids separate and move to opposite ends of the cell.
   C. half chromosomes are made inactive.
   D. homologous pairs of chromosomes pair up along their length.
   E. chromosomes become invisible.
21. Chromosomes exchange genetic information by
A. fertilization.
B. mitosis.
C. syngamy.
D. DNA replication.
E. crossing over.

22. Between the two divisions of meiosis there is
A. a full cell cycle.
B. a pairing of homologues.
C. replication of some parts of the chromosomes.
D. no S phase.
E. random combination among chromatids.

23. Crossing over of chromosomes takes place in
A. prophase II.
B. prophase I.
C. interphase II.
D. interphase I.
E. metaphase II.

24. The synaptonemal complex develops early in meiosis. It is
A. a cluster of chromatids at the end of the cell.
B. a framework of microtubules that organize chromatids.
C. a lattice of proteins that holds homologues together.
D. a set of two homologues lined side by side.
E. the wound up regions of DNA molecules.

25. At the end of telophase II of meiosis, each of the four resulting cells contains
A. one full set of chromosomes, each with two chromatids.
B. two full sets of chromosomes, each with two chromatids.
C. one full set of chromosomes, each a single chromatid.
D. two full sets of chromosomes, each a single chromatid.
E. a different number of chromosomes.

27. Sexual reproduction increases genetic variability through all of the following except
A. crossing over in prophase I of meiosis.
B. independent assortment in meiosis.
C. fertilization.
D. mitosis.

29. Which of the following is an explanation for independent assortment, a factor in producing genetic variability?
A. In anaphase I, where how one pair separates does not affect how any other pair separates.
B. Chromosomes are divided into daughter cells in a random fashion.
C. In prophase I, which chromosomes pairs with which other one is completely random.
D. Each chromosome is capable of a different function.
E. Chromosomes can have different functions in various types of cells of the same organism.
30. Meiosis and mitosis are both processes that involve nuclear division. What is the difference between the two?
A. Mitosis is nuclear division, which ultimately leads to haploid gametes. Meiosis is nuclear division, which ultimately leads to diploid somatic cells.
B. Mitosis is nuclear division, which ultimately leads to diploid somatic cells. Meiosis is nuclear division, which ultimately leads to haploid gametes.
C. Mitosis is nuclear division, which ultimately leads to diploid gametes. Meiosis is nuclear division, which ultimately leads to haploid somatic cells.
D. Mitosis is nuclear division, which ultimately leads to syngamy. Meiosis is nuclear division, which ultimately leads to zygotes.

31. After fertilization, the resulting zygote develops by which of the following processes?
A. mitosis
B. meiosis
C. syngamy
D. synapsis
E. reduction division

33. A reproductive biologist is examining reproductive cells at the end of meiosis I. She notices that each of the two resulting cells are haploid. She also knows that meiosis II will produce haploid cells. How can her observations be explained?
A. There must be an error and she needs to refocus her microscope and look again.
B. The cells that resulted from meiosis I are in fact haploid, but are composed of two sister chromatids. The sister chromatids will be pulled apart during meiosis II, producing haploid gametes.
C. The cells that resulted from meiosis I are in fact diploid and this explains her observational error and also her knowledge of the meiosis II resulting in haploid cells.
D. The cells that resulted from meiosis I are in fact haploid, but her knowledge of the result of meiosis II is not accurate, at least for this particular cell type.
E. The cells that she observed are abnormal and will require further observations.

34. Crossing over occurs during prophase I of meiosis I. The two sister chromatids of each homologous pair of chromosomes remain attached by
A. a common centromere and the synapsis.
B. a common centromere and the chiasmata.
C. a common centromere and the recombination synapsis.
D. a common centromere and the synaptonemal complex.
E. a common centromere and the spindle fibers.

35. The majority of the meiosis I is spent in prophase I and metaphase I. After metaphase I is completed, anaphase I and telophase I quickly proceed, thus ending meiosis I. What immediately follows meiosis I?
A. DNA synthesis
B. prophase II
C. metaphase II
D. developing of a synapsis
E. crossing over of the homologues
36. All of the following are processes that promote new genetic combinations except
A. crossing over.
B. random fertilization.
C. independent assortment.
D. mitosis.
E. natural selection.

38. Meiosis also has been called reduction division because
A. new somatic cells are produced but with a reduction in the required amount of time, which promotes faster wound healing.
B. new gametes are produced but their numbers are reduced.
C. there is a reduction in the chromosome number during two separate nuclear and cell divisions to produce gametes.
D. there is a reduction in the chromosome number during two separate nuclear and cell divisions to produce somatic cells.
E. there is an initial reduction in the chromosome number during the first division followed by an increase in chromosome number, the second division quickly follows the increase in number of chromosomes.

46. You are studying mitosis in an organism that has 28 chromosomes as its diploid number. How many chromosomes will the cell have after mitosis, but before cytokinesis?
A. 7
B. 14
C. 28
D. 56

47. You are studying meiosis in an organism that has 28 chromosomes as its diploid number. How many chromosomes will each nucleus have after meiosis I, but before cytokinesis?
A. 14
B. 28
C. 56
D. cannot determine from the information provided

48. You are studying meiosis in an organism that has 28 chromosomes as its diploid number. How many chromosomes will the cell have after meiosis II, but before cytokinesis?
A. 14
B. 28
C. 56
D. cannot determine from the information provided
56. In 95% of cases of Down's syndrome, there is an entire extra chromosome 21 in every cell. This aneuploid condition is the result of
A. improper crossing over.
B. independent assortment.
C. nondisjunction.
D. achiasmate segregation.

**Genetics**

10. A diploid organism that has two identical alleles for the same trait is called _______ for that particular trait.
A. homozygous
B. heterozygous
C. dominant
D. recessive
E. codominant

11. A gene for a particular trait that is only expressed in the presence of another gene of the same kind is called a(n)
A. dominant gene.
B. codominant gene.
C. incompletely dominant gene.
D. recessive gene.
E. multiple allele.

15. Mendel chose the garden pea for his work on inheritance for all of the following reasons except
A. he failed his examination for a teaching certificate.
B. earlier investigators had shown segregation among the offspring.
C. a large number of true breeding varieties were already available.
D. the generation time was short; many offspring can be grown easily.
E. he could choose to self- or cross-pollinate.

16. Mendel's experiments had all of the following characteristics except
A. pea plants were self-pollinated for several generations.
B. he always used only two plants for his work.
C. hybrid plants with alternative forms of traits were produced.
D. hybrid plants were self-pollinated for several generations.

17. Mendel referred to the trait that was expressed in the hybrid, F1 or first filial generation as
A. recessive.
B. dominant.
C. codominant.
D. independent.
E. epistatic.

18. In a typical Mendel experiment on pea-seed color, if the dominant yellow seed-bearing plant was crossed with the recessive green seed-bearing plant, the F2 generation will show what ratio of each kind?
A. 1 yellow: 3 green
B. 1 yellow: 1 green
C. 3 yellow: 1 green
D. seeds with patches of green and yellow color
E. tall plants with yellow seeds and short plants with green seeds
19. Mendel's understanding of the inheritance of traits in peas, expressed in modern language, included all of the following except
A. parents transmit information encoded in genes.
B. each individual contains two genes for each trait.
C. not all genes are identical; alternative forms (alleles) exist.
D. each of the alleles present in an individual is discrete.
E. if a given allele is present, its effects will be seen in the individual.

20. Individuals carrying two "factors" for most traits are
A. haploid.
B. diploid.
C. eukaryotic.
D. homozygous.
E. heterozygous.

21. When the two haploid gametes contain two different alleles of a given gene, the resulting offspring is called
A. discrete.
B. a haploid.
C. heterozygous.
D. homozygous.
E. a fused allele.

22. In a heterozygous individual the allele being expressed is
A. recessive.
B. masked.
C. redundant.
D. dominant.
E. epistatic.

23. An allele that is present but unexpressed is
A. redundant.
B. dominant.
C. functional.
D. epistatic.
E. recessive.

24. The genetic make-up of an individual is referred to as its
A. blueprint.
B. genotype.
C. phenotype.
D. genetic pattern.

25. The observable outward manifestation of the genes or physical trait of an individual is referred to as its
A. blueprint.
B. genotype.
C. phenotype.
D. genetic map.
26. What is the name of the cross that involves the mating of a hybrid F₁ plant with a homozygous recessive plant for the same trait?
   A. monohybrid cross
   B. dihybrid cross
   C. reciprocal cross
   D. test cross
   E. back cross

28. Mendel's first law encompasses all of the following except
   A. alternative forms of trait are encoded by alternative alleles.
   B. alternative alleles segregate in gametes.
   C. either allele has equal probability to be passed on into the gamete.
   D. all genes found in an individual are not separable into gametes.

29. An individual possessing both kinds of alleles of two different traits is called
   A. homozygote.
   B. monohybrid.
   C. dihybrid.
   D. true breed.
   E. diallelic.

30. Let P = purple flowers and p = white, and T = tall plants and t = dwarf. What would be the appearance of a plant with the genotype PpTt?
   A. purple flowers, tall
   B. purple flowers, dwarf
   C. white flowers, tall
   D. white flowers, dwarf
   E. pale purple flowers, intermediate height

31. Let P = purple flowers and p = white, and T = tall plants and t = dwarf. What combinations of gametes could be produced by a heterozygote for both the traits?
   A. PpTt only
   B. Pp, Tt
   C. P, p, T, t
   D. PT, Pt, pT, pt
   E. infertile, no gametes produced

32. Let P = purple flowers and p = white, and T = tall plants and t = dwarf. Of the 16 possible gamete combinations in the dihybrid cross, how many would be the phenotype white, tall?
   A. none
   B. 1
   C. 3
   D. 9
   E. 16

34. One of the main reasons genes assort independent of one another is that
   A. they produce unrelated traits.
   B. they produce related traits.
   C. they are on the same chromosome.
   D. they are different alleles.
   E. they are on different chromosomes.
35. A single gene has 3 or more alternative forms. These are called
   A. heterozygotes.
   B. multiple alleles.
   C. epistatic.
   D. homozygotes.
   E. multiple zygotes.

36. Sometimes one gene pair will interact so as to control the expression of a second gene pair in an
   interaction called
   A. dominance.
   B. gene regulation.
   C. recessiveness.
   D. pleiotropy.
   E. epistasis.

37. If an individual allele has more than one effect on the phenotype it is said to be
   A. pleiotropic.
   B. epistatic.
   C. recessive.
   D. dominant.
   E. homozygotic.

38. ABO blood group expression is an example of
   A. epistasis.
   B. dominance.
   C. recessiveness.
   D. multiple alleles.
   E. pleiotropy.

39. When Mendel crossed dark purple-flowered pea plants with white-flowered pea plants, he

40. When Mendel crossed two purple-flowered pea plants with each other, he obtained a phenotypic ratio
   of 3:1 (purple-flowered pea plants to white-flowered pea plants). His results are consistent with which of
   the following sets of parents?
   A. homozygous dominant purple pea plant and homozygous recessive white pea plant
   B. homozygous dominant purple pea plant and heterozygous white pea plant
   C. heterozygous purple pea plant and homozygous recessive white pea plant
   D. heterozygous purple pea plant and homozygous dominant purple pea plant
   E. heterozygous purple pea plant and heterozygous purple pea plant

41. Height and eye colors are two examples of continuous variation in humans. Whereas in pea plants the
   tall allele is dominant over the short allele, there are no intermediate heights in peas. Which of the
   following is the best explanation for the differences described above?
   A. Humans are more advanced than pea plants; thus, the genetics of peas is much simpler than humans.
   B. The intermediate size pea plant seeds are aborted within the seedpod and thus will never develop.
   C. The intermediate size pea plant seeds have deleterious alleles that prevent them from germinating.
   D. Many genes, rather than one gene for a characteristic, control some variations in species.
   E. These variations in humans are affected by lack of dominance in the alleles that control these traits.
42. Children born in areas where proper nutrition is not available to them do not always realize their full growth potential. These children have the genes for normal growth of bones. Which of the following statements can best explain this situation?
A. There is a lack of dominance in the alleles for normal bone growth; as a result, the genotype is directly affected.
B. Since nutrition is necessary for proper development and is a part of the environment, it is a clear case of environmental effect on the phenotype.
C. Since nutrition is necessary for proper development and is a part of the environment, it is a clear case of environmental effect on the genotype.
D. There will always be examples that reflect this condition in human populations because of the continuous variation that exists for this characteristic.
E. The children's parents did not obtain the proper nutrients when they were young and thus were not able to pass on the alleles for normal growth and development.

43. Irene and William are having their first child. Irene knows her blood type is A, but William does not know his blood type. However, William knows that his mother and father were B. Their first child is a boy named Gregory. Gregory has type O blood. Of course, Irene and William do not understand how this happened. You could explain this to them using which of the following choices?
A. Irene's genotype is AA, and William's genotype is OO; thus, Gregory expresses the phenotype of O.
B. Irene's genotype is AO, and William's genotype is BO; thus, Gregory expresses the phenotype of O.
C. Because his parents were both type B, William could not be the father of Gregory.
D. Gregory's blood type will need to be checked after his first month of life if the parents want to know his blood type. It takes about a month for the blood type to develop in a newborn child.
E. Since Irene is type A, there had to be a mix-up in the lab report. Gregory should have been type A.

44. A person who has lost a large amount of blood but is still alive is found in a wrecked automobile under a highway bridge. Several people are helping the paramedics load the victim into the ambulance. After the ambulance has departed for the hospital, you overhear the following conversation from the persons who helped the paramedics. "I am certain that when that guy gets to the hospital, they will transfuse him with any blood that they have in the blood bank since he has lost so much blood." The other person says, "Yeah, I bet you're right!" Having had a biology course, you know which blood could be safely given to anyone. Select it below.
A. A
B. B
C. AB
D. O

53. In white tigers, the absence of fur pigmentation is caused by a recessive allele. This allele also causes the tigers to be cross-eyed. If two tigers heterozygous for this allele mate and produce offspring, what percentage can be expected to be white and/or cross-eyed?
A. 25% will be white and the same 25% will be cross-eyed.
B. 25% will be white and 25% will be cross-eyed, but not necessarily the same 25% due to independent assortment.
C. 50% will be both white and cross-eyed.
D. Because it is a recessive allele, none of the offspring in the F1 generation will be white or cross-eyed.
56. Let Y = yellow and y = green, and R = round and r = wrinkled. You cross YYRR peas with yyyrr peas. All of the F1 individuals are yellow and round with a genotype of YyRr. You then perform a F2 cross and get the expected 9:3:3:1 phenotypic ratio. Which of the following is the correct genotypic ratio for yellow, round F2 individuals?
A. 1/16 YYRr, 2/16 YYRR, 2/16 YyRR, 4/16 YyRr
B. 1/16 YyRr, 2/16 YYRr, 2/16 YyRR, 4/16 YYRR
C. 1/16 YYRR, 1/16 YYRr, 1/16 YyRR
D. 1/16 YYRR, 2/16 YYRr, 2/16 YyRR, 4/16 YyRr

58. Let R = red pigment and r = no pigment. In carnations, RR offspring make a lot of red pigment, rr offspring make no pigment and Rr offspring make a small amount of red pigment, thus appearing pink. Pink carnations are therefore an example of
A. codominance.
B. incomplete dominance.
C. epistatic interaction.
D. blending.

59. You can use a Punnett square to do all of the following except
A. determine gametic possibilities.
B. predict phenotypic ratio.
C. determine genotypic ratio.
D. establish a pedigree.

61. Achondroplasia is a common form of dwarfism caused by autosomal dominant mutation in the fibroblast growth factor receptor gene 3. If a person with achondroplasia married and had children with a person of normal height, what is the probability that both their child would have achondroplasia?
A. 1/8
B. 1/4
C. 1/2
D. 1

Other stuff:
1. Be familiar with pedigrees and pedigree analysis of recessive, dominant and sex-linked (X-linked) disorders.