

7. List three major ways that mitosis and meiosis differ.

	Mitosis	Meiosis
1	Produces daughter cells genetically identical to the parent cell.	Produces haploid daughter cells with one member of each homologous chromosome pair.
2	Involves one division of the nuclei and is usually accompanied by cytokinesis producing two diploid cells	Involves two nuclear and cytoplasmic divisions yielding four haploid cells.
3	When the cycle is complete daughter cells contain all chromosomes from parent. $2n=2$	When both cycles are complete sister chromatids are separated. $2n=4$

8. List three ways genetic variation occurs in sexually reproducing organisms. Explain one.

1. Independent orientation of the chromosomes at metaphase I.
2. Random fertilization
3. Crossing over during prophase I of meiosis.

Random fertilization is the fact that we have 23 different sets of genes in our makeup. Each partner has 2^{23} or about 8 million possible chromosome combinations. When both combinations are added together, the union of the male and female, the possible chromosome combinations are around 64 trillion.

9. Describe how Klinefelters and Turners syndromes are alike and how they differ in chromosome array and in phenotype.

Abnormal combinations of the sex chromosomes cause both syndromes. Klinefelters syndrome affects males and Turners syndrome affects females. Klinefelters syndrome carries an extra X chromosome and Turners syndrome lacks an X chromosome.

10. Draw four ways chromosomes are altered in ways that can cause cancer and birth defects.

nondisjunction - 0.15

XXY

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