**Part 1**

1) Compare the similarities and differences between Mitosis and Meiosis I/II.

|  |  |  |
| --- | --- | --- |
| Mitosis | Meiosis I | Meiosis II |
|  |  |  |

2) Is Mitosis more like Meiosis I or II? Explain your answer.

**Part 2**

1) Below are 2 pairs of duplicated homologous chromosomes (chromosome number 6 and 21) about to segregate in meiosis. Work through Meiosis I and II to find all the possible daughter cells containing a combination of these 2 chromosomes. Draw out all the possible daughter cells. Ignore the crossing over event during Prophase I for simplicity. Note: each homologous chromosome pair is the same size but is shaded differently. \*\*Bonus: what is the probability of getting each of your possible daughter cells?\*\*

21

6

2) During meiosis, chromosomes not segregating properly may result in daughter cells containing an extra or lacking a copy of a chromosome (hopefully your drawings in the previous question didn't have this error). This is how certain genetic disorders occur in individuals with this chromosome abnormality. Down Syndrome is an example of a genetic disorder where an individual has 3 copies of chromosome 21. Go online and research another disease related to an abnormal number of chromosomes (hint: didn't someone ask about more/less sex chromosomes in class?). Make sure to record the following below:

- Name of the disease

- Which chromosome(s) were involved and how they were involved

- The symptoms of this disease

- How common is this disease?

**Part 3**

Your textbook discusses the different types of chromosome mutations on page 194.

Below is an unduplicated chromosome 6. The marked lines along the chromosomes are specific genes on specific sites of chromosome 6, labeled A, B, C, D, and E. Each question will tell you to mutate the chromosome a certain way. Draw the resultant chromosome and the CORRECT ORDER that these genes would be located on the chromosome. The first example is done for you.

D

E

C

B

A

Example: Invert the boxed region.

E

D

C

B

A

A

C

D

D

E

1) Delete the boxed region.

E

D

C

B

A

2) Move the selected region to the new indicated region without inverting the gene order.

A

B

C

D

E