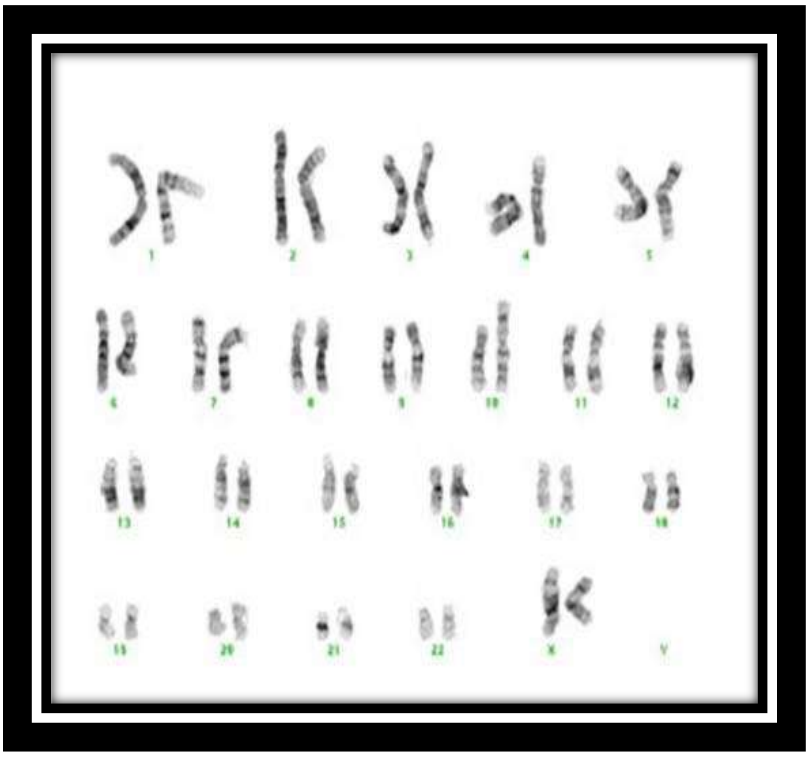
Name: _____ Block: _____ Date: _____

Karyotype Activity

Part A: Analysis of a "Normal" Karyotype

Observe the karyotype below:



Is this Karyotype of a male or female?

Explain your answer.

_____

_____

_____

_____

_____

Part B: "What's Wrong with my Karyotype?"

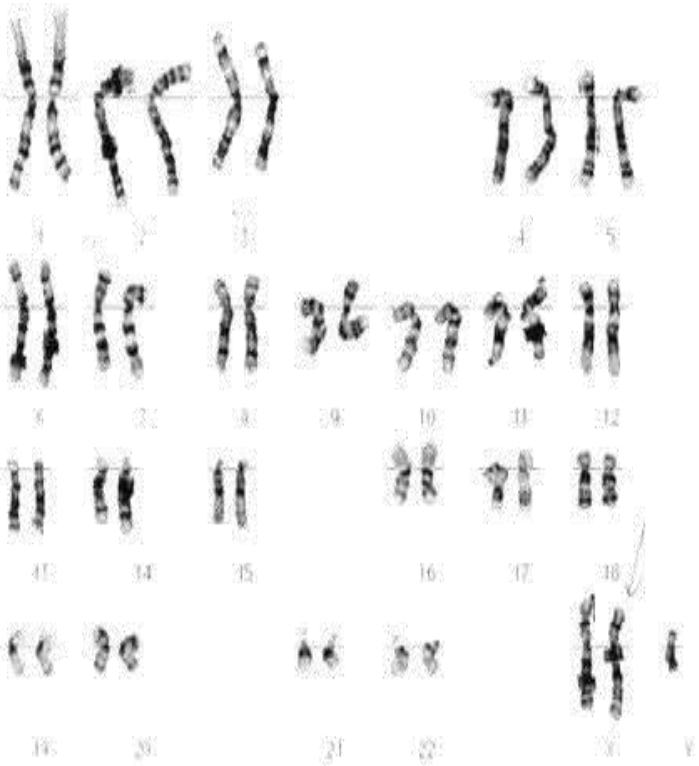
For each of the given karyotypes complete the following steps:

1. Identify: Next to each karyotype, identify it as either normal or abnormal. If the karyotype is normal skip to step #3.

2. Abnormality: If the karyotype is abnormal, circle the abnormality in the karyotype. Then explain what is wrong with the karyotype, and where the abnormality is located specifically on the chromosome. You will be looking for missing chromosomes and/or parts of chromosomes, extra chromosomes and/or parts, or anything that makes the karyotype abnormal or different from the normal karyotype above with the exception of the 23rd pair of chromosomes.

3. Gender: Identify the karyotype as male or female.

Karyotype #1



Is the Karyotype normal or abnormal?

_____

If abnormal, what is wrong in this karyotype? Where specifically is the abnormality located?

_____

_____

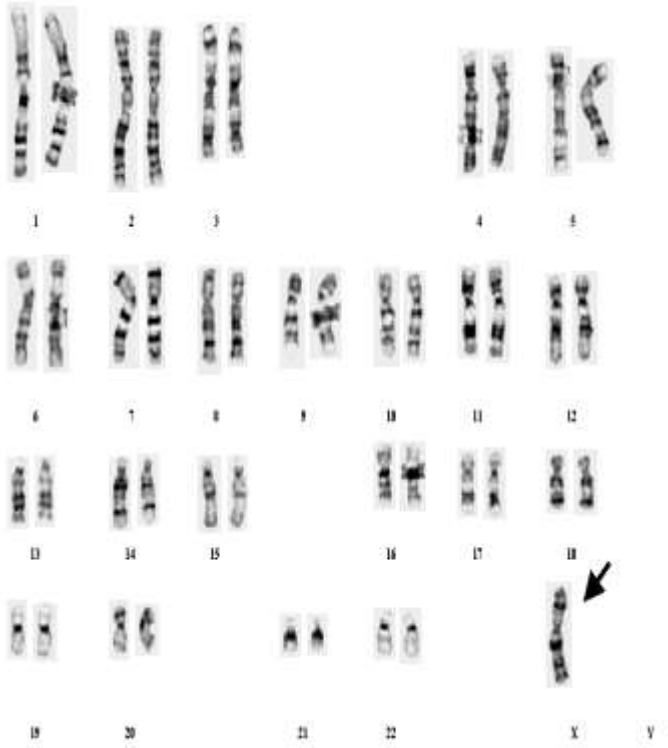
_____

_____

_____

The gender of the karyotype is _____

Karyotype #2



Is the Karyotype normal or abnormal?

_____

If abnormal, what is wrong in this karyotype? Where specifically is the abnormality located?

_____

_____

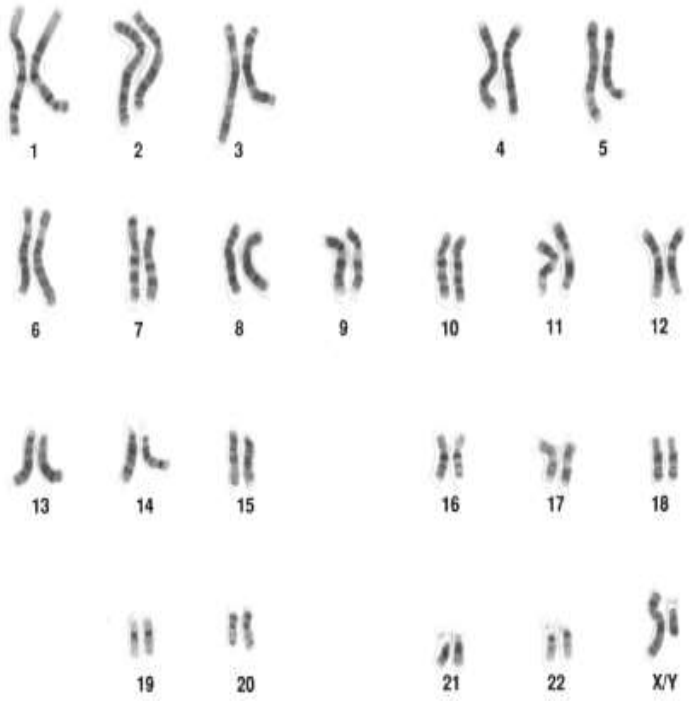
_____

_____

_____

The gender of the karyotype is _____

Karyotype #3



Is the Karyotype normal or abnormal?

_____

If abnormal, what is wrong in this karyotype? Where specifically is the abnormality located?

_____

_____

_____

_____

_____

The gender of the karyotype is _____

Part C: Analysis Questions

1 How many autosomes (any chromosome that that is not a sex chromosome) are in a normal human karyotype? _____

2 Explain the following statement: The human male determines the sex of all of his offspring.

_____

_____

_____

3 Explain how genetic counselors might use karyotypes with their patients.

_____

_____

_____

Part D: Identifying Genetic Disorders

The chart below describes several genetic chromosomal abnormalities and their symptoms. All of the abnormalities below result from nondisjunction.

Name of Abnormality	Affected Chromosome	Brief Description of the Resulting Phenotypic Abnormality
Down Syndrome	21	47 chromosomes, mental retardation with specific characteristics or physical features, may have heart defects and respiratory problems.
Edwards Syndrome	18	47 chromosomes, severe mental retardation very characteristic malformations of the skull, pelvis, and feet among other things. Die in early infancy.
Patau Syndrome	13	47 chromosomes, abnormal brain function that is very severe, many facial malformations, usually die in early infancy.
Turner's Syndrome	Female XO only 1 X chromosomes	45 chromosomes, in females only, missing an X chromosome, secondary sex characteristics do not develop, infertile.
Klinefelter's Syndrome	Male XXY 2 XX chromosomes	47 chromosomes, in males only, tall, sterile, small testicles, otherwise normal in appearance.
XYY Syndrome	Male XYY 2 YY chromosomes	47 chromosomes, in males only, low mental ability, otherwise normal in appearance.
Triple X Syndrome	Female XXX extra X chromosomes	47 chromosomes, sterility sometimes occurs, normal mental ability.

USE THE CHART

Now go back to karyotypes #1-7 in Part B and identify the genetic abnormality by name. If there are NO abnormalities in the karyotype write "normal" on the line.

Karyotype #1 _____

Karyotype #2 _____

Karyotype #3 _____