Name: _____ Date: _____ Class: _____

Gait Analysis Activity Assessment Answer Key

Answer <u>one</u> of the following questions in complete sentences. (Circle the # of the one you choose.)

1. What is data analysis?
    Data analysis is the process of collecting, analyzing, modeling data and making predictions.

2. How can a predictive model be developed and used to interpret new data?
    Data is collected by experiment, survey or research and is sorted or graphed to make trends visible. A mathematical model is generated to interpolate and extrapolate from existing data so predictions can be made from new data.

3. What are some limitations on the reliability of a model constructed by analyzing data?
    The reliability of a model is limited by the volume and accuracy of the data collected. A model's effectiveness can be analyzed using statistical measurements like variance and correlation.

Complete the following performance assessment.

The following Gait Signature Metric (GSM) values were calculated for a group of human subjects.

	Adult 1	Adult 2	Adult 3	Child 1	Child 2	Child 3
GSM 1	3.35	4.46	1.24	3.76	5.97	2.08
GSM 2	1.78	1.63	1.43	4.39	2.89	2.16

4. Which GSM value is likely to yield a more reliable model for predicting whether a new subject is an adult or child? Justify your answer.
    GSM 2 is more likely to yield a reliable model, since the value for every adult is 1.78 or less while the value for every child is 2.16 or greater.

5. Analyze the data in the table to construct a model for predicting whether a new subject is an adult or a child. Show your work and justify your methodology.
    If GSM 2 is 1.78 or less, the subject is an adult. If GSM 2 is 2.16 or greater, the subject is a child. If GSM 2 is between 1.78 and 2.16, then if GSM 2 is closer to 1.78, then the subject is predicted to be an adult, and if GSM 2 is closer to 2.16, then the subject is predicted to be a child.

The following Gait Signature Metric (GM) values were calculated for two new subjects:

	New Subject 1	New Subject 2
GSM 1	2.39	1.83
GSM 2	1.49	2.10

6. Use your model (from question 5) to predict whether each new subject is an adult or a child. Explain your reasoning, including an assessment of the reliability of your prediction.
    GSM 2 for New Subject 1 is less than 1.78, so the subject is an adult. GSM 2 for New Subject 2 is between 1.78 and 2.16 and is closer to 2.16, so the subject is predicted to be a child.