PreCalculus

Give Me and Arm and A Leg!

In this investigation we will refresh our memory of some algebraic concepts by manually calculating a Median-Median best-fit line for a set of collected linear data.

1. Collect a set of measures of the length of the forearm and clothed foot of all your classmates and your self. Include a matched pair of data for the left arm and foot, and then the right arm and foot. Measure in centimeters, to the nearest millimeter. Provide the complete list of data.

From elbow to wrist

From heel to toe

2. Let the length of the arm be the independent variable and the leg be the dependent. Plot these points. Partition the data into three groups, the 1^{st}, 2^{nd} and 3^{rd} thirds.

3. Identify the Median X (Arm) and the Median Y (Leg) for each third, and plot these three points on the graph above. Make sure to identify these points on the graph. Draw vertical lines on the graph to show the Thirds.

Third	Median X	Median Y
1^{st}		
2^{nd}		
3^{rd}		

4. Find the equation of the line passing through the points for the Median in the 1^{st} and 3^{rd} Thirds. Graph this line on the plot above and identify.

   Y_{13} = _____

5. Find the equation of the line that passes through the Median point for the 2nd Third with the same slope as the equation from question 4. Graph this line on the plot above and identify it.

   Y_2 = _____

6. Find the weighted average of the y-intercepts to use with the common slope above to get the Median-Median line of fit.

   $$\frac{\text{y-intercept of } Y_{13} + \text{ y-intercept of } Y_2 + \text{ y-intercept of } Y_{13}}{3}$$

   Graph this line on the plot above and identify it.

   Y_{123} = _____

7. Compare this equation with the one generated by your TI-83 Plus when you do the Med-Med regression.

8. Submit all graph and data lists.