

**Heart rate versus age**



On page 1.2, you will see a list of data for age and heart rate. Work through the steps to find an equation to model the relationship between age and heart rate.

- Which is the independent variable, age or heart rate? Which is the dependent variable?

Create a scatter plot on page 1.3 of the data. Click on the text that reads “Click here to add variable” to plot the independent variable on the x-axis and the dependent variable on the y-axis.

1. Estimate the line of fit by hand.

Follow the directions on page 1.5 to “draw” a line of best fit by hand. To add a moveable line to the graph on page 1.3, first make sure that the *Data & Statistics* application, not the *Notes* application, is selected. (Press **(ctrl) + (tab)** if needed.) Then select **MENU > Actions > Add Movable Line**.

You can move the line two different ways. If the cursor looks like \oplus , press and hold  to grab the line, then use the TouchPad to shift the line without changing its slope. If the cursor looks like \curvearrowright , press and hold  to grab the line, then use the TouchPad to rotate the line.

- Record the equation of your line here: _____

2. Use the upper and lower quartiles.

To calculate the one-variable statistics on page 1.7, move to the **agestats** column, then select **MENU > Statistics > Stat Calculations > One-Variable Statistics**. Choose **1** as the number of lists and click OK. Then select or type **age** as the **X1** list and **a[]** as the **First Result Column**. Repeat in the **rhrstats** column to find the one-variable statistics for **rhr** using **rhr** as the **X1** list and **d[]** as the **First Result Column**.

- Record the Age and Heart Rate quartiles in the table below.

	Age	Heart Rate
Q1		
Q3		



Find a Line of Best Fit

Plot the quartiles of the independent variable as vertical lines using **Plot Value**. Go to **MENU > Actions > Plot Value** and type **age.q1**. Repeat with **age.q3**. Next, plot the quartiles of the dependent variable as horizontal lines using **Plot Function**. Go to **MENU > Actions > Plot Function** and type **rhr.q1**. Repeat with **rhr.q3**.

- What are the coordinates of the corners of the rectangle formed by the vertical and horizontal lines? (Use the **Graph Trace** feature from the Analyze menu, if needed.) Record the coordinates here. _____
- Write the equation of the diagonal line across the rectangle that connects two of the corners in point-slope form. Use **Plot Function** to graph this line.

3. Use the regression command.

Find the linear regression equation that models the data. On page 1.3, select **MENU > Actions > Regression > Show Linear**. Record the equation here. _____

- Which of the three lines graphed do you think fits the data best? Why?