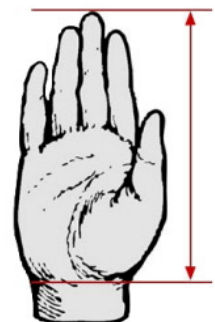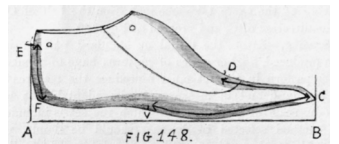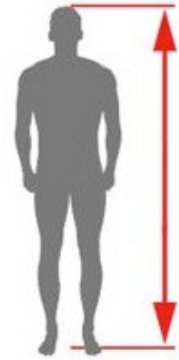## CSI: AAT: TRMHS

Stolen TI-84s! While investigating a crime scene at a local high school, detectives noticed a single pair of footprints approaching and departing the scene. Also, on a window sill, they recovered a handprint. They wanted to know if they could infer the height of the culprit based on these data.
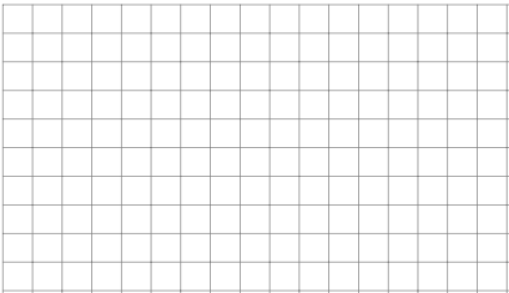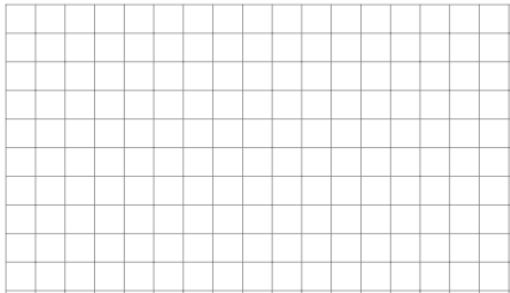
I. Collect Data
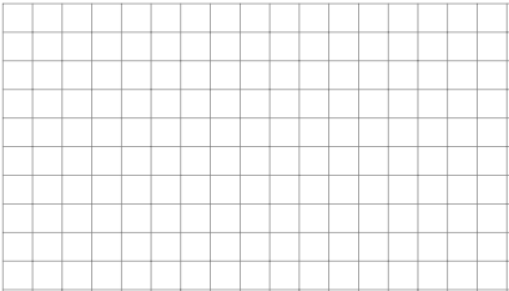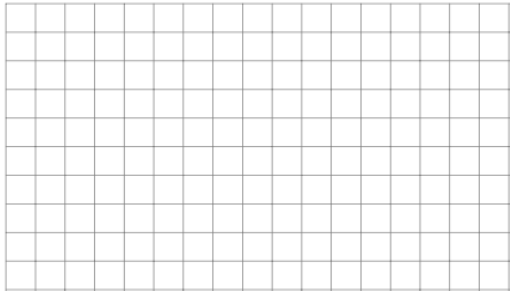
Using our class as specimen, complete the table below:

Name	Stride Length (inches)	Actual Shoe Length (Inches)	Hand Length (inches)	Height (Inches)
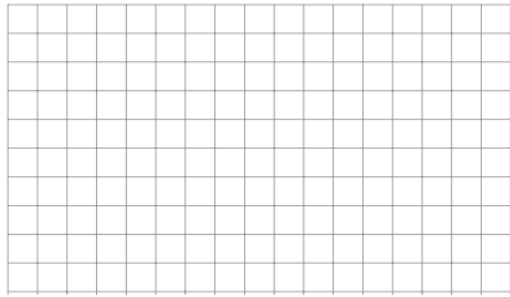
II. Create Models

Stride vs Height: making stride your independent variable, complete the following table.	
Linear Model:	Exponential Model:
$r \approx$, $r^2 \approx$	$r \approx$, $r^2 \approx$
Residual Graphs (Make sure to label scales)	
Which model is a better fit and why?	
Shoe Size vs Height: making shoe size your independent variable, complete the following table.	
Linear Model:	Quadratic Model:
$r \approx$, $r^2 \approx$	$R^2 \approx$
Residual Graphs (Make sure to label scales)	
Which model is a better fit and why?	

Hand length vs Height: making stride your independent variable, complete the following table.	
Linear Model:	_____ Model:
$r \approx$ $, r^2 \approx$	$r \approx$ $, r^2 \approx$
Residual Graphs (Make sure to label scales)	
Which model is a better fit and why?	

III. Data Analysis

1. Based on the model, is it fair to infer a person's height from their stride? Explain.

2. Based on the model, is it fair to infer a person's height from their shoe size? Explain.

3. Based on the model, is it fair to infer a person's height from their hand size? Explain.

IV. **Case Analysis**

1. Using the linear/exponential model (circle one) you chose on the previous pages, calculate the approximate heights based on the following stride lengths:

    a. 30 in _____

    b. 18.1 in _____

    c. 19.9 in _____

2. Using the linear/quadratic model (circle one) you chose on the previous pages, calculate the approximate heights based on the following shoe sizes:

    a. 6.5 in _____

    b. 7.75 in _____

    c. 11.5 in _____

3. Using the linear/_____ model (circle one) you chose on the previous pages, calculate the approximate heights based on the following hand lengths:

    a. 5.5 in _____

    b. 7.75 in _____

    c. 6.3 in _____

4. The detectives measured the shoe size at the crime scene to be 12 in. The stride length *to* the scene was about 34 inches but *away* from the scene was 46 inches. The hand length was 7.5 inches. Using these data, give a range of potential heights. Then explain the difference in the stride length.

5. Are there any other inferences about the suspect one can make from the data? Explain.