Warm Up

Write the equation of the line with a slope = 1/3 and passes through the point (12, 20).

$$y = \frac{1}{3}x + b$$

$$20 = \frac{1}{3}\left(\frac{12}{1}\right) + b$$

$$20 = 4 + b$$

$$\underline{-4 \quad -4}$$

$$16 = b$$

$$y = \frac{1}{3}x + 16$$

Why put 1 under 12?

$$\frac{1}{3}\left(\frac{12}{1}\right) = \frac{12}{3} = 4$$

to make it easier to multiply straight across.

4.1 Vitruvian Man
Relating Body Measurements

More than 2,000 years ago, a Roman architect and writer named Vitruvius found patterns by relating two body measurements. He claimed a person's arm span is equal to his or her height.

- Do you think the relationship between arm span and height applies to the students in your class?

- How would you display and analyze data collected to test the claim made by Vitruvius?

How do you graph if all your data is clumped far from the origin?

The table shows the height and arm span of students in a CMP class.

Height (in.)	56	57	57	58	59	60	60	60	62	64	64	66	67	67	67	68
Arm span (in.)	54	57	54	61	56	58	59	60	62	63	62	62	65	67	69	67

not helpful

56

0   54

56

0   54
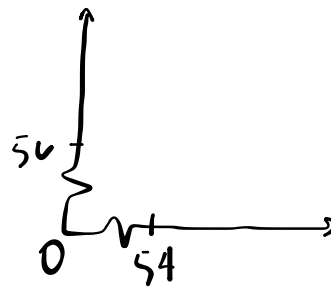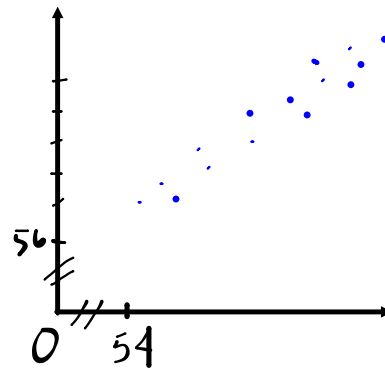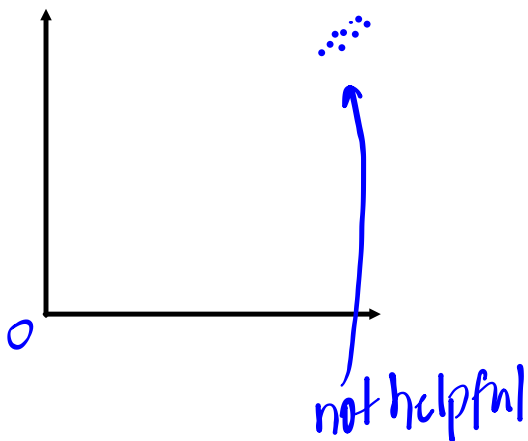
Problem 4.1

The table shows the height and arm span of students in a CMP class.

x
y

Height (in.)	56	57	57	58	59	60	60	60	62	64	64	66	67	67	67	68
Arm span (in.)	54	57	54	61	56	58	59	60	62	63	62	62	65	67	69	67

? Do you think the data support the claim that arm span and height are about equal?

x   y

(x,y)

A Analyze the data to test your ideas.

1. Plot the (height, arm span) data on a coordinate graph. The resulting graph is called a **scatter plot**.

2. Do you think the scatter plot supports the claim that arm span and height are about equal for most people?

Problem 4.1 *continued* **Parts A, B and D**

Handwritten annotations:
$$s = h$$
$$y = x$$
$$y = 1x + 0$$

3. If each student in the class had arm span *s* equal to height *h*, what equation would relate the two variables?

   a. Graph the equation on your scatter plot.

   b. Which data points (if any) does your line pass through? Explain how arm span and height are related in those points.

   c. Choose several data points that are not on your line. Explain how arm span and height are related in each case. How do you describe the relationship shown on the graph?

B The tallest person in recorded history was Robert Pershing Wadlow. At age 22, he was 8 feet 11.1 inches (272 cm) tall. His arm span was 9 feet 5.75 inches (289 cm).

   1. Where would you plot the point (height, arm span) for Robert Wadlow? Would the point be *on*, *above*, or *below* the line you drew in Question A, part (3)?

   2. Does the data point for Robert Wadlow support the claim that arm span and height are roughly equal?

Parts A, B and D

D The dinosaur *Tyrannosaurus rex* grew to 20 feet in height with an arm span of about 10 feet.

   1. Do you think the *T. rex* data point fits the pattern that arm span and height are roughly equal? Explain.

   2. If you plot the data point, would it be *on*, *above*, or *below* the line you drew in Question A, part (3)?

Homework

Page 100, #'s 6a-d and 7a-b