

4.4**Notetaking with Vocabulary**

- I can draw and interpret scatter plots.
- I can identify correlations between data sets.
- I can use lines of fit to model data.

Write the meaning of each vocabulary term.

scatter plot - see below

correlation - a relationship between data sets

+ correlation \Rightarrow as $x \uparrow$, $y \uparrow$
 - correlation \Rightarrow as $x \uparrow$, $y \downarrow$

no correlation
 \Rightarrow as $x \uparrow$, y is random

line of fit (trend line) - used when a
 $+/-$ correlation is seen in data.

- use line to model the trend

Scatter Plot

A scatter plot is a graph that shows the relationship between two data sets.

The two data sets are graphed as ordered pairs in a coordinate plane. Scatter plots can

show trends in the data.

Using a Line of Fit to Model Data

Step 1 Make a scatter plot. Remember title, labels and scale.

Step 2 Decide whether the data can be modeled using a line.
 (+/- correlation?)

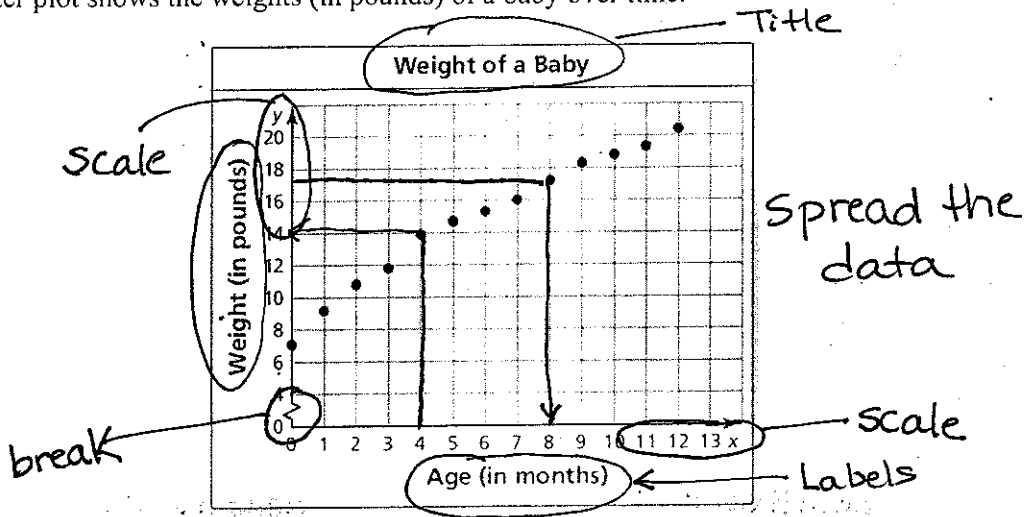
Step 3 Draw a line that appears to fit the data closely.

- ① same # of points above/below the line
- ② points evenly distributed along line

Step 4 Write an equation using 2 points ON THE LINE.
 They do not have to be data points.

Practice

1. The scatter plot shows the weights (in pounds) of a baby over time.



a. What is the weight of the baby when the baby is four months old?

14 pounds

b. What is the age of the baby when the baby weighs 17.2 pounds?

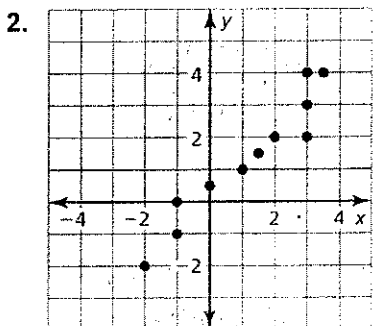
8 months

c. What tends to happen to weight of the baby as the age increases?

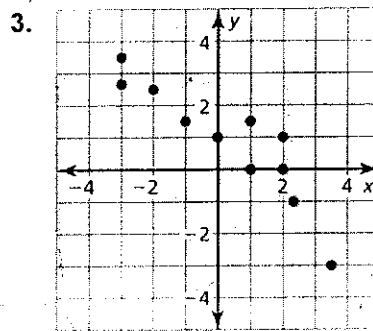
As age increases, so does the baby's weight.

4.4 Notetaking with Vocabulary (continued)

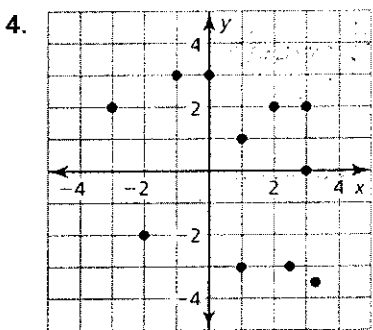
In Exercises 2–5, tell whether x and y show a *positive*, a *negative*, or *no* correlation.



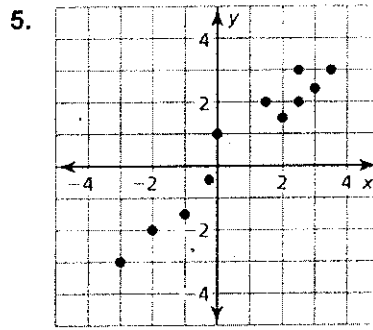
positive c.



negative c.



no correlation



positive c.

6. The table shows the depth y (in centimeters) of water filling a bathtub after x minutes.

Time (minutes), x	0	2	4	6	8	10	12
Depth (centimeters), y	6	8	11	14	17	20	24

Range 12

Range 18

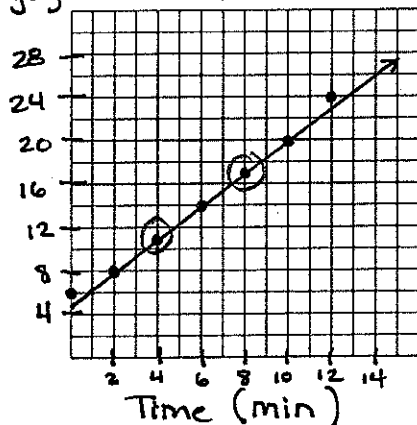
$(0, 6)$ $(2, 8)$

a. Draw a scatter plot of the data. Does the data exhibit a linear trend?

Yes the data exhibit a linear trend. x is positively correlated with y .

Depth (cm)

y by 2 Bath Tub Fill Rate



no break
 $\frac{24}{16} = 1.5$

16 boxes

$\frac{18}{16} \approx 1.125$

x by 1

If so, what type of correlation do you see?

$$y = mx + b$$

b. Write an equation that models the depth of the water as a function of time. (Find a line of fit).

$$\begin{array}{cc} (4, 11) & (8, 17) \\ x_1, y_1 & x_2, y_2 \end{array}$$
$$m = \frac{17-11}{8-4} = \frac{6}{4} = \frac{3}{2}$$

$$y - y_1 = m(x - x_1)$$
$$y - 11 = \frac{3}{2}(x - 4)$$

$$y - 11 = \frac{3}{2}x - 6$$

$$y = \frac{3}{2}x + 5$$

line of fit

c. Interpret the slope and y-intercept of the line of fit.

slope

Every 2 minutes, the water increases 3 cm.

Unit rate? $\frac{1.5 \text{ cm}}{\text{min}}$

When timing was started the water depth was already 5 cm.