

4.4 Scatter Plots & Lines of Fit with work

Algebra 1: 4.4 Scatter Plots and Lines of Fit

Learning Outcomes:

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

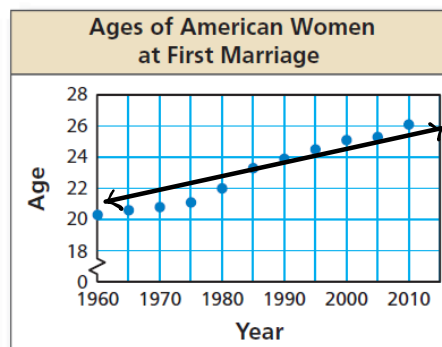
Core Concept

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.

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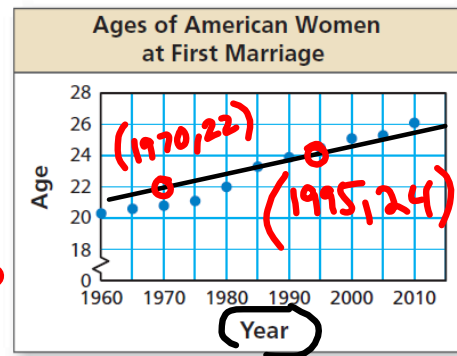
The scatter plot shows the median ages of American women at their first marriage for selected years from 1960 through 2010. Write an equation of the line. Let x represent the number of years since 1960. Explain the method you used.



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4.4 Scatter Plots & Lines of Fit with work

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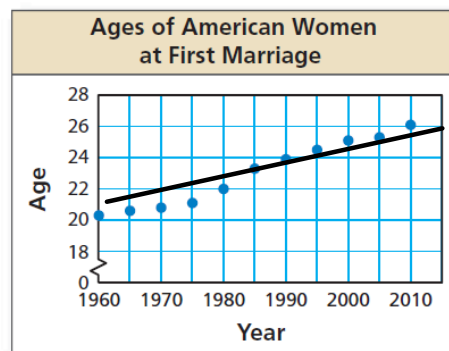
$$y - y_1 = m(x - x_1)$$

$$y - 24 = \frac{2}{25}(x - 35)$$

$$m = \frac{24 - 22}{35 - 10} = \frac{2}{25}$$

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The scatter plot shows the median ages of American women at their first marriage for selected years from 1960 through 2010.



a) What conclusions can you make from the equation you wrote?

Ages increase each year.

b) Use your equation to predict the median age of American women at their first marriage in the year 2020. $x = 60$

$$y - 24 = \frac{2}{25}(x - 35)$$

$$y - 24 = \frac{2}{25}(60 - 35)$$

$$y = 26$$

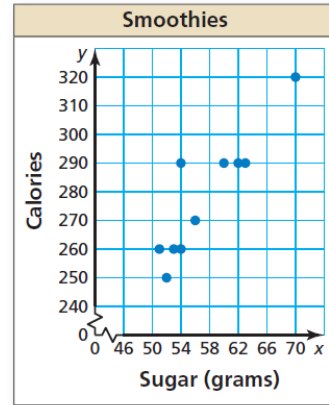
26 years of age

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4.4 Scatter Plots & Lines of Fit with work

YOUR TURN:

The scatter plot shows the amounts x (in grams) of sugar and the numbers y of calories in 10 smoothies.



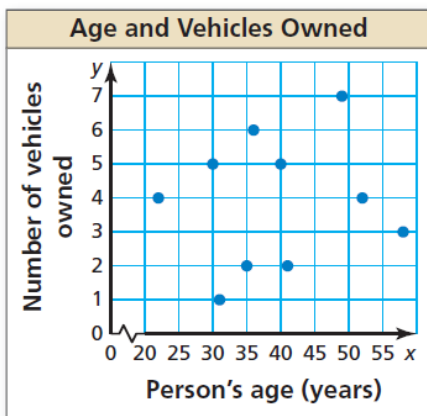
- How many calories are in the smoothie that contains 56 grams of sugar? **270 calories**
- How many grams of sugar are in the smoothie that contains 320 calories? **70 grams**
- What tends to happen to the number of calories as the number of grams of sugar increases? **increases**

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Identifying Correlations:

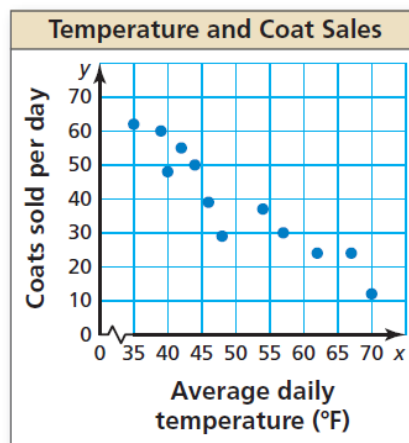
Tell whether the data show a **positive**, a **negative**, or **no correlation**.

a. age and vehicles owned



positive

b. temperature and coat sales at a store



negative

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Core Concept

Using a Line of Fit to Model Data

Step 1 Make a scatter plot of the data.

Step 2 Decide whether the data can be modeled by a line.

Step 3 Draw a line that appears to fit the data closely. There should be approximately as many points above the line as below it.

Step 4 Write an equation using two points on the line. The points do not have to represent actual data pairs, but they must lie on the line of fit.

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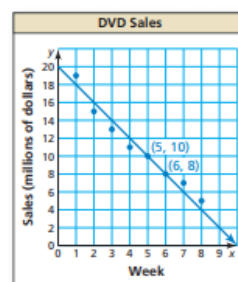
Example 2:

The table shows the weekly sales of a DVD and the number of weeks since its release. Write an equation that models the DVD sales as a function of the number of weeks since its release. Interpret the slope and y-intercept of the line of fit.

Week, x	1	2	3	4	5	6	7	8
Sales (millions), y	\$19	\$15	\$13	\$11	\$10	\$8	\$7	\$5

$$m = \frac{8-10}{6-5} = -2$$

$$y - 8 = -2(x - 6)$$



Slope of -2 means the sales are decreasing by about \$2 million each week. The y-intercept, $(0, 20)$, has no meaning in this scenario because there are no sales in week 0.

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4.4 Assignment

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