Algebra 1   4.5
Investigate relationships between quantities by using scatterplots
Use lines of fit to make and evaluate predictions

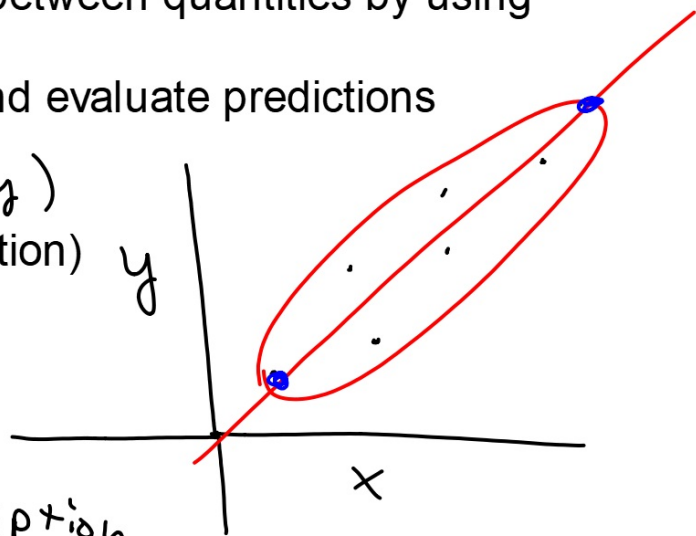bivariate data (x, y)
line of fit (prediction equation) y
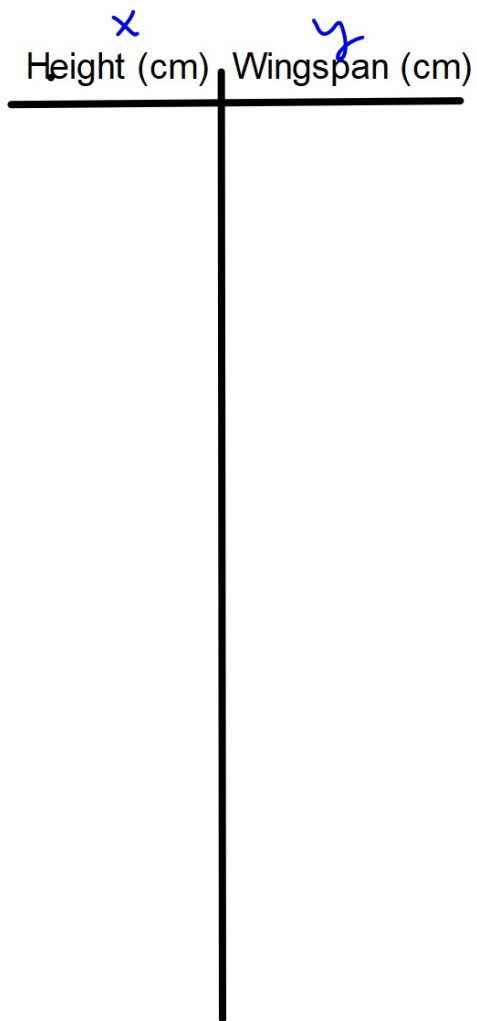independent variable (x)
Dependent variable (y)
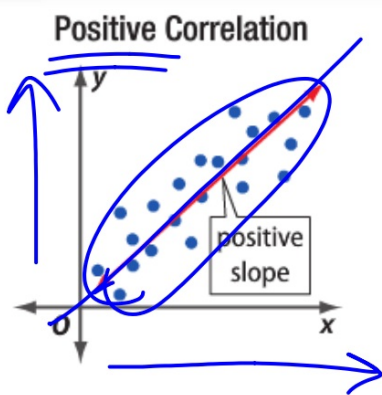interpolation
extrapolation
r   correlation   quick description

x

Height (cm) Wingspan (cm)
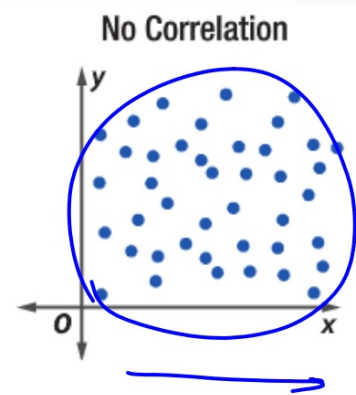
x y

ConceptSummary Scatter Plots

Positive Correlation

positive slope

As *x* increases, *y* increases

Negative Correlation

negative slope
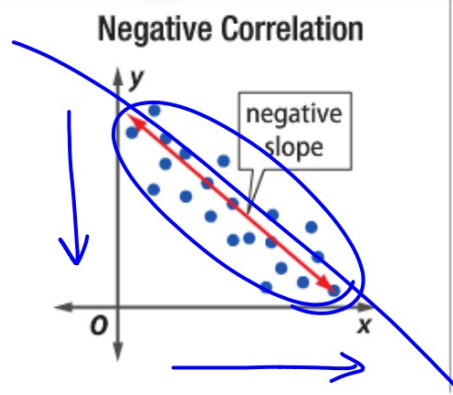
As *x* decreases, *y* decreases

No Correlation

x and *y* are not related

WAGES Determine whether the graph shows a *positive*, *negative*, or *no* correlation. If there is a positive or negative correlation, describe its meaning in the situation.

Wages
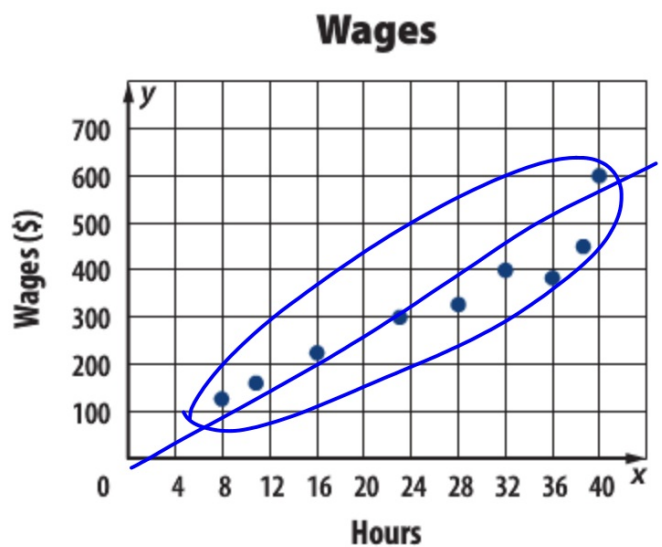
"It goes up" is not the kind of answer I am looking for.

1. Refer to the graph on international travel. Determine whether the graph shows a *positive*, *negative*, or *no* correlation. If there is a positive or negative correlation, describe its meaning.

International Travel

A scatter plot titled "International Travel" with the y-axis labeled "Travelers (thousands)" ranging from 40,000 to 65,000, and the x-axis labeled "Year" ranging from 1985 to 2010.
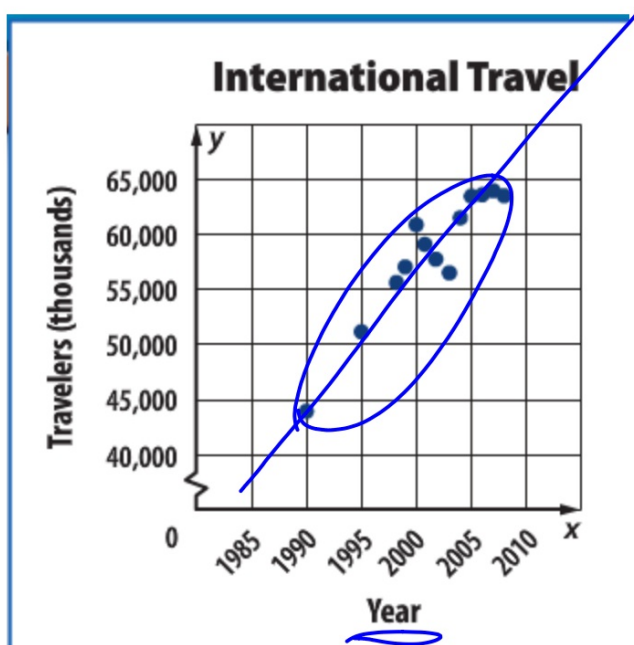
TRAVEL Use the scatter plot to find the approximate number of United States travelers to international countries in 1996.

51,000,000 travelers

International Travel

63,554

44,623

Travelers (thousands)

Years Since 1990
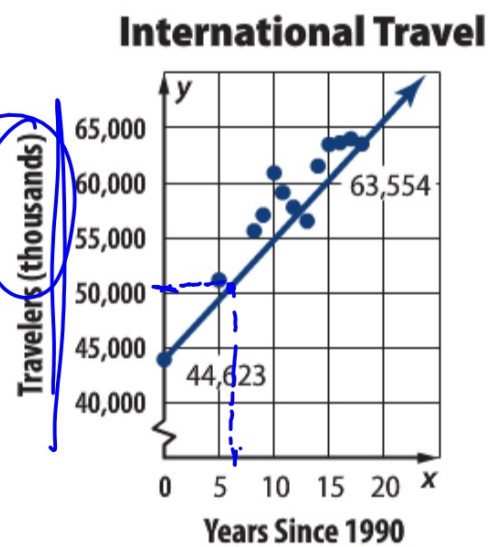
Source: *Statistical Abstract of the United States*

ROLLER COASTERS The table shows the largest vertical drops of nine roller coasters in the United States and the number of years after 1988 that they were opened. Identify the independent and the dependent variables. Is there a relationship in the data? If so, predict the vertical drop in a roller coaster built 30 years after 1988.

x

y

Years Since 1988	1	3	5	8	12	12	12	13	15
Vertical Drop (ft)	151	155	225	230	306	300	255	255	400

Source: Ultimate Roller Coaster

550 ft

Vertical Drops of Roller Coasters

Vertical Drop (ft)

400
350
300
250
200
150
100
50

0   2   4   6   8   10   12   14 x

20   30

Years Since 1988
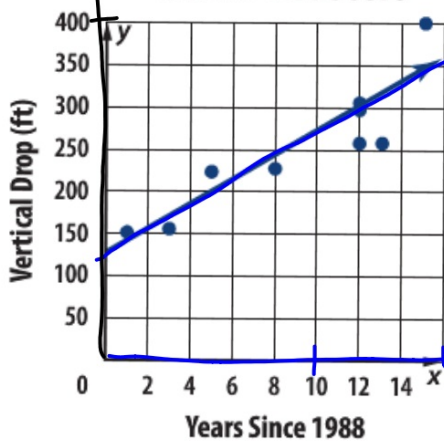
550 ft

extrapolation
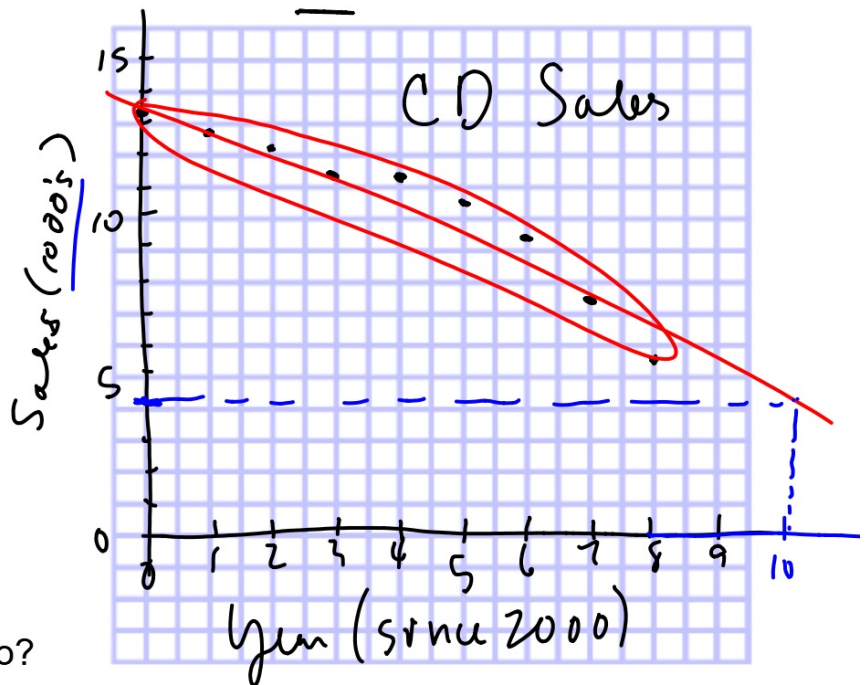extend past
your data to
predict

Since 2000

2. **MUSIC** The table shows the dollar value in millions for the sales of CDs for the year. Make a scatter plot and determine what relationship exists, if any.

X

Year	2000 0	2001 1	2002 2	2003 3	2004 4	2005 5	2006 6	2007 7	2008 8
Sales	13,215	12,909	12,044	11,233	11,447	10,520	9373	7452	5471

2010

4000
CD's
Sold

CD Sales

Sales (1000's)

Year (since 2000)

Graph the scatterplot
Where would a reasonable line go?
Use 2 points on the line:
    far apart is better than close together
Write an equation
Sometimes follow-up question

3. MUSIC Use the equation for the line of fit for the data in Guided Practice 2 to estimate CD sales in 2015.