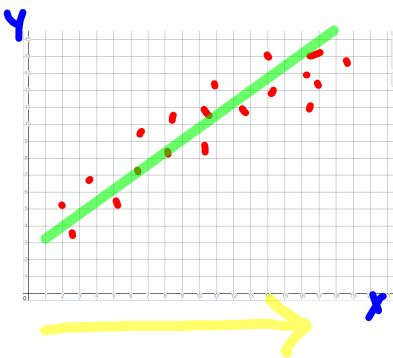


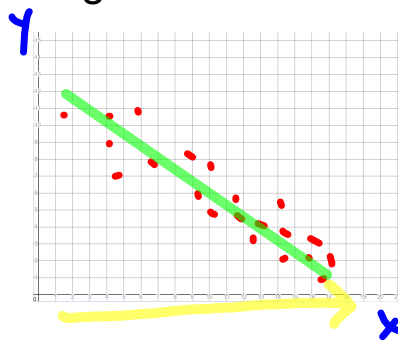
## Algebra 1 - Lesson 4.4 Scatter Plots

Correlation: A Relationship between data. Can either be Positive, Negative, or None

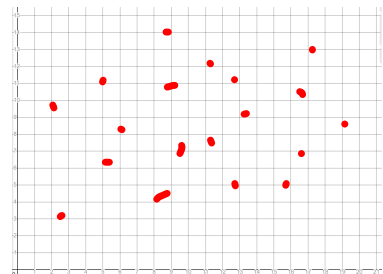
Positive Correlation



Negative Correlation



No Correlation



- Positive Correlation: As x increases, y tends to...

Increase (Going up)

- Negative Correlation: As x increases, y tends to...

Decrease (Going Down)

No Correlation: As x increases, y...

- follows no pattern
- Doesn't increase or decrease.

## 4.4 Scatter Plots

Ex: What type of correlation does the following data table represent?

x: Temperature in °F

y: Attendees (in thousands)

X	82	78	68	87	75	71	92	84
Y	4.5	4.0	1.7	5.5	3.8	2.9	4.7	5.3

Method 1 (Faster way): Rearrange the table from least to greatest (x variable), Then look at the y values and see if they increase, decrease, or bounc around.

X	68	71	75	78	82	84	87	92
Y	1.7	2.9	3.8	4.0	4.5	5.3	5.5	4.7

Y values are increasing

Make a concluding statement about the data:

There appears to be a positive correlation.

- as temperatures increase the attendees tend to increase.

Interpreting  
the Data.

## 4.4 Scatter Plots

Ex: Determine the correlation for the data set provided.

x: Weeks after DVD Release

y: Sales (in millions)

*Already Arranged from Least to Greatest*

X	1	2	3	4	5	6	7	8
Y	19	15	13	11	10	8	7	5

*y is tending to Decrease.*

Method 2 (Slower but more useful): Graph the points on a coordinate plane. Make sure to choose an appropriate scale for x and y based on the numbers given.

→ Points:

$(1, 19)$   $(3, 13)$   
 $(2, 15)$   $(4, 11)$   
 $(5, 10)$   $(6, 8)$   
 $(7, 7)$   $(8, 5)$

Plot the points...  
(in Green)

we can see a  
Negative correlation.

*y's going by 2's.*



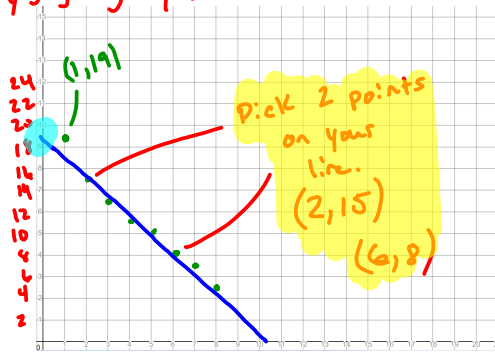
*x's going by 1's.*

Since the minimum x is 1 & the max is just 8, going by 1's spreads the data out more on the graph compared to going by 2's.

## 4.4 Scatter Plots

Part 2: Draw a line of best fit for the data on the previous slide (Copy it here) *y's going by 2's.*

Try to draw the line through the data



*x's going by 1's.*

a) Write an equation that models the situation. Explain what your variables represent.

b) estimate the DVD sales 24 days after release.

c) estimate the time it will take for the dvd sales to drop to 1 million.

a)  $y$ : sales (millions)       $x$ : weeks after release (DVD)

We need to find the slope

$$\begin{matrix} (2, 15) & (6, 8) \\ x_1 & x_2 \\ y_1 & y_2 \end{matrix}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 15}{6 - 2} = \frac{-7}{4}$$

y-intercept looks like 19.

since I have slope & y-int. use slope-intercept form

$$y = mx + b \quad \text{so...} \quad y = -\frac{7}{4}x + 19$$

b) 24 days is around 3.5 weeks.

so plug in 3.5 to  $x$ . solve for  $y$

$$y = -\frac{7}{4}(3.5) + 19$$

use calculator

$$y \approx 12.875 \text{ millions of sales,}$$

c) plug 1 in for  $y$ , solve for  $x$ .

$$\begin{aligned} 1 &= -\frac{7}{4}x + 19 \\ -19 & \quad \quad \quad -19 \\ -\frac{4}{7} \cdot -18 &= -\frac{7}{4}x \cdot -\frac{4}{7} \end{aligned}$$

multiply by reciprocal to cancel the fraction

$$\frac{72}{7} = x$$

$$x \approx 10.29 \text{ weeks}$$

Homework:

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