Welcome to class!

Turn In:

1. City Map Project should be in the in-box
2. MALM Poster should be submitted on Google Classroom
3. Scatter Plots and Trend Lines worksheet should be on your desk
4. Unit 5 Corrections due 11/26

Do:

1. Clear your calculator's memory
2. Graph the following scatter plot on your graphing calculator:
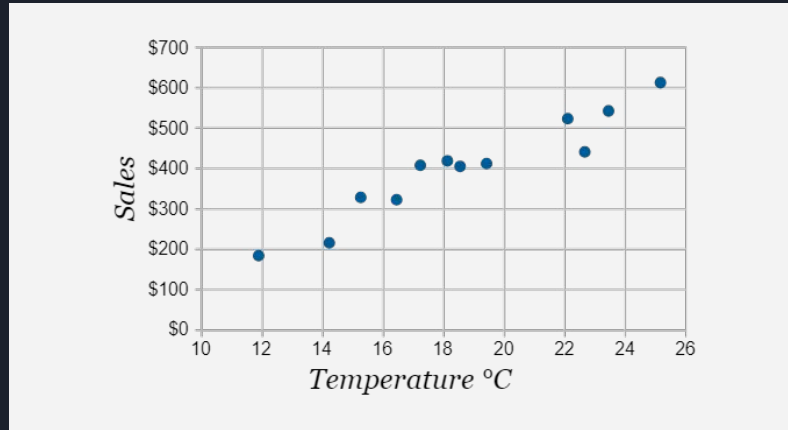
x	2	- 3	4	8
y	12	- 14	- 11	15

3. Write the equation of a line that goes through (4, 3) and is perpendicular to y=3x+2.

Let's talk about your scatter plot worksheet

Scatter Plot → A graph that shows the relationship between two sets of data. It looks like a line graph without connecting the dots.
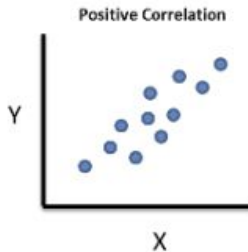
Example:

Let's talk about your scatter plot worksheet

Correlation → Describes the type of relationship between two sets of data as positive, negative, or no correlation.
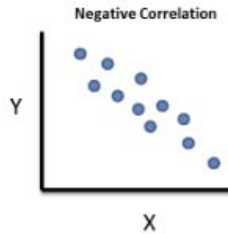
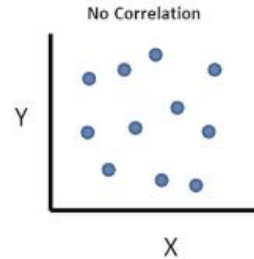## Three Types of Correlation

Positive Correlation

Positive Correlation

Y

X

<u>Positive Correlation</u>
Both x and y values increase
Both x and y values decrease

Negative Correlation

Negative Correlation

Y

X

<u>Negative Correlation</u>
One value increases
One value decreases

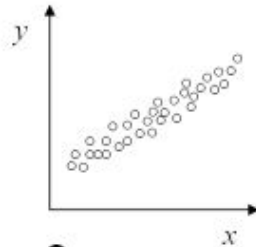### No Correlation

No Correlation

Y

X

<u>No Correlation</u>
Does not increase or decrease

Let's talk about your scatter plot worksheet

Correlation → Describes the type of relationship between two sets of data as positive, negative, or no correlation.
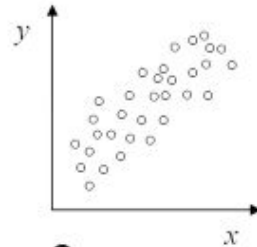
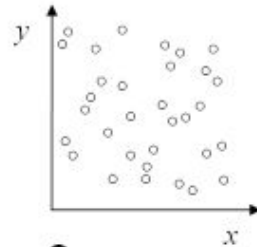## Strong Correlation vs. Weak Correlation

Strong Correlation

① All of the points are close to the line of best fit

Weak Correlation

③ The points are not close to the line of best fit

Let's talk about your scatter plot worksheet

Do the data sets have a positive, negative or no correlation?

1) The temperature outside and the number of ice cream cones sold.
2) The size of a bag of popcorn and the price of the bag of popcorn.
3) The amount of time spent exercising and the number of calories burned.
4) The discount percent of an item and the sale price of an item.
5) The number of video games someone owns and their height.

Let's talk about your scatter plot worksheet

Graphing calculator on the back page… how did it go?

Scatter Plots and Trend Lines
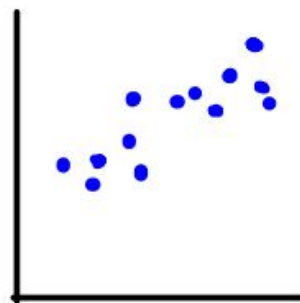
11/16/2018

Pass out guided notes for today

You should be able to fill in the following questions already:

1. What is a scatter plot
2. What is correlation
3. Positive, negative, and no correlation?
4. Weak or strong correlation?

What is a line of best fit? - trend line that comes closest to all points (most points on line, about the same above the line as below the line)
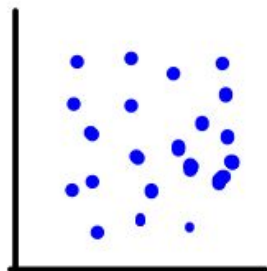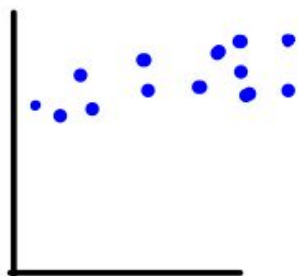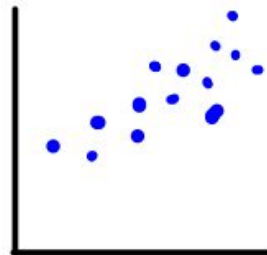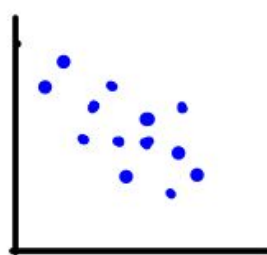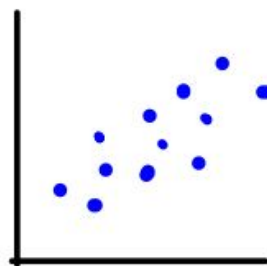
Correlation Coefficient (r): tells you how close the equation of the line of best fit models the data

If r is close to 1 or -1 it shows that the data lie close to the line of best fit with a positive slope (1) and a negative slope (-1)

If r is close to 0, there is no correlation.

You can use the trendline to do several things.

Interpolation: Estimating a value between two known values

Extrapolation: Predicting a value outside the range of known values

Causation: When a change in one quantity causes a change in a second quantity

In each situation, tell whether a correlation is likely. If it is, tell whether the correlation reflects a causal relationship. Explain your reasoning.

11. the number of practice free throws you take and the number of free throws you make in a game

12. the height of a mountain and the average elevation of the state it is in

13. the number of hours worked and an employee's wages

14. a drop in the price of a barrel of oil and the amount of gasoline sold

Flip onto the back - it's calculator time!

Clear your calculator's memory

2nd, +, 7, >, >, ENTER, 2

EVERY TIME YOU CLEAR YOUR CALCULATOR:
2nd, 0, Diagnostic On

Graph a scatter plot on your calculator:

1) STAT; EDIT; ENTER
2) Enter x's in L1 column and y's in L2 column
3) Go to Y= and turn Plot 1 on
4) Graph

* If you do not see your graph then your window needs to be adjusted. Use the ZOOM button.

Let's graph a scatter plot together as a class:

(3, 4), (5, 1), and (8, -1)

We already knew all of that, so let's learn something new!
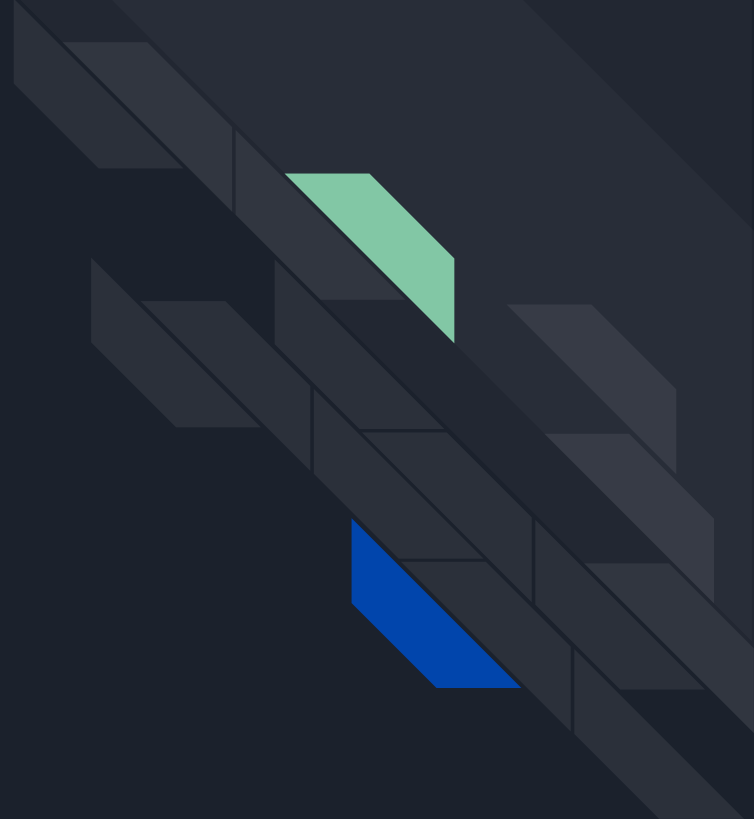
To graph the trend line (aka line of best fit):

1) STAT, CALC, LinReg, ENTER
2) Press ENTER until the equation appears
3) Now go to y= and click VARS, 5, > >, ENTER

This is like your phone...

You know how you are much faster than your parents at texting, looking something up, or just general use of your phone?

It's like that with your calculator. It seems really tricky to make it do what you want right now, but with practice it becomes intuitive, just like your phone.

For each table, make a scatter plot of the data. Describe the type of correlation the scatter plot shows.

Test Scores

Test Score	76	85	83	97	92
Study Time (min)	33	52	49	101	65

1.

Tickets Sold

Adult Tickets	10	20	30	40	50
Children Tickets	30	55	80	112	137

2.

Use the table below and a graphing calculator for Exercises 3 through 6.

Florida Resident Population									
Year	1980	1990	1995	2000	2002	2003	2004	2005	2006
Population (in thousands)	9746	12,938	14,538	15,983	16,682	16,982	17,367	17,768	18,090

Source: U.S. Census Bureau

3. Make a scatter plot of the data pairs (years since 1980, population).

4. Draw the line of best fit for the data.

5. Write an equation for the trend line.

6. According to the data, what will the estimated resident population in Florida be in 2020?

Today's Big Ideas

- Scatterplots are just graphs of a bunch of data
- Positive, negative, or no correlation
- Weak or strong correlation (correlation coefficient r helps with this)
- Does the situation show causation?
- You can estimate a trend line by sketching it
- You can find the exact trend line by using your calculator (you need lots of practice with this to make it feel like your phone!)
- You can use the trend line to make estimates - interpolations and extrapolations

Kahoot

Let's get some practice

Graph the scatter plot and trend line on your calculator

5	13	15	16	19	30
3	5	17	21	24	40

Estimate y when x = 4

Is this interpolation or extrapolation?

What is the correlation coefficient? What does it mean?

Let's get some practice

Graph the scatter plot and trend line on your calculator

-3	-13	15	17	24	-2
0	-15	8	5	24	4

Estimate y when x = 4

Is this interpolation or extrapolation?

What is the correlation coefficient? What does it mean?

Homework

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