

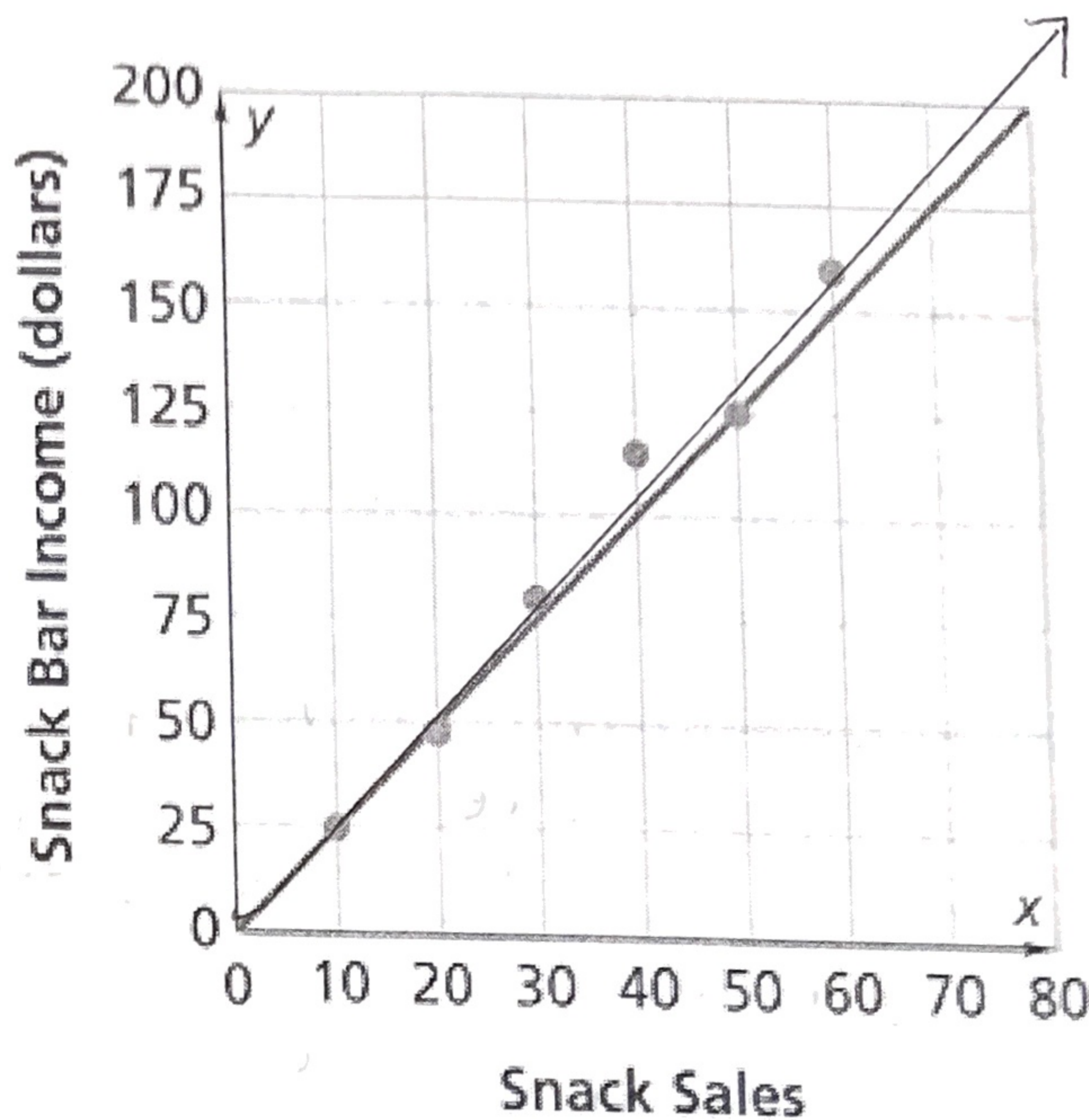
Unit 3b Day 19 and 20: Finding the BEST Line of Best Fit

Focus Question: How do I find the real line of best fit?

A. Regression Practice:

- Use the calculator to find the correct modeling line for the snack bar sales using the following table. Draw it (close anyways) on the graph.

Snack Sales	Income
10	25
20	49
30	80
40	118
50	125
60	158



$y = 2.66x - 0.6$

- The table gives the minutes of TV students watched and their score on a test the following day.

Minutes of TV watched	30	90	80	10	0	105	50
Test Score	75	62	72	81	84	53	71

a. Graph it on the calculator.

b. What type of correlation exists? What information will this tell you?

negative
slope should be neg.

c. Go through the regression steps on the calculator.

d. What is the equation of the regression line?

$y = -0.25x + 83.94$

e. What does the slope mean?

-0.25 The score goes down by 0.25 points for every minute of tv watched.

f. What does the y intercept mean?

83.94 is the expected test score if you watch zero minutes of tv.

g. What is the correlation coefficient? What does it mean?

$r \approx -0.93$ The relation is negative & strong.

n. Amy watched 40 min of tv.
~74%

i. Willie watched 2 hrs. before the test.

3. The table gives the high school and later university GPA of students.

- a. Create a scatter plot of the data. What type of correlation does high school and college GPA appear to have?

Positive Linear (Strong $r \approx 0.86$)

- b. Find the regression equation for predicting university GPA from high school GPA.

$$y = 0.8x + 0.7$$

- c. What is the slope? And what does it represent?

0.8 The Univ. GPA will increase by 0.8 points based on every 1 high school point

- d. What is the y intercept? What does it represent?

0.7 If you have a 0 pt. gpa for high school, you'd get a 0.7 for college

- e. If someone had a 2.2 high school GPA, what is the best estimate of their college GPA? Did you interpolate or extrapolate?

its in the domain

$$\approx 2.5$$

- f. If someone had a 4.0 GPA in high school, what is the best estimate of their college GPA? Did you interpolate or extrapolate?

its outside the domain

$$\approx 3.9$$

- g. Do you feel high school GPA is a good predictor of university GPA? Use math to explain your answer.

Yes b/c the correlation coeff. is $r \approx 0.86$ which is still in the strong category.

High School GPA	University GPA
3.45	3.52
2.78	2.91
2.52	2.4
3.67	3.47
3.24	3.47
2.1	2.37
2.82	2.4
2.36	2.24
2.42	3.02
3.51	3.32
3.48	3.59
2.14	2.54
2.59	3.19
3.46	3.71
3.51	3.58

Round to nearest tenth

4) The table at right shows the number of toys sold by the Mattel Toy Company during the 2000's.

Year since 2000	Millions of toys sold
0	31.6
1	32.8
2	34.6
3	36.5
4	40.1
5	42.7

Nearest hundredth

Positive Linear

a) What is the regression equation?

$$y = 2.27x + 30.72$$

b) What is the correlation coefficient?

What does that mean? It's really strong
 $r \approx 0.98$

c) Use the equation to estimate how many toys were sold in 2009. Did you interpolate or extrapolate?

its outside the domain

≈ 51.11 million

d) In what year will Mattel sell 73.85 million toys?

y value

Around 2019 to 2020

e) What is the slope? What does it represent?

2.27

The toy sales increase 2.27 million

every year since 2000

f) What is the y intercept? What does it represent?

30.72

They sold ^{about} 30.72 million toys in 2000.