

Linear Regression

Name _____ Class Period _____

Find the **line of best fit** and the **correlation coefficient** for the following data.

1.

X	Y
3	10
5	22
6	21
10	45
15	48
22	52

2.

X	Y
150	34
167	43
182	32
197	21
202	28
211	37

3.

X	Y
8	101
12	89
15	94
20	67
25	72
28	43

4.

X	y
76	23
49	3
10	89
125	32
178	43
16	90

You work for a traveling carnival, and your exhibit has been struggling with a lack of customers. You bought a new megaphone and decide to run an experiment. Each day, you randomly choose a volume setting (from 1 to 10) on the megaphone. You use the megaphone throughout the day and record the number of customers that visit your exhibit. The data is given in the table below.

Volume Setting	5.	5.	3.1	6.8	6.2	5.	6.8	5.5	4.1	4.1	4.8	1.5	5.6	5.1
# People	195	96	90	188	183	166	200	161	72	157	137	68	192	156

- Find an **equation of the best-fit line** and **the correlation coefficient**. Label each variable.
- What does the slope and y-intercept represent in this scenario?

7. Students in Ms. Garth's Algebra II class wanted to see if there are correlations between test scores and time spent watching television. The students created a table in which they recorded 13 student's average number of hours per week spent watching television and scores on a test. Use the actual data collected by the students in Ms. Garth's class, as shown in the table below, to answer the following questions.

TV hrs/week (average)	30	12	30	20	10	20	15	12	15	11	16	20	19
Test Scores	60	80	65	85	100	78	75	95	75	90	90	80	75

- Find the **best fitting linear model** that represents the data and the **correlation coefficient**.
- Identify the y-intercept. What does it represent in the context of the problem?
- Using this model, what is the estimated test score of a student who watches TV for 35 hours?
- Using this model, what is the highest number of hours a student can watch TV and still pass the test (make a 70)?

8. A convenience store manager notices that sales of soft drinks are higher on hotter days so he assembles the data in the table.

High Temperature (°F)	Number of cans sold
55	340
58	335
64	410
68	460
70	450
75	610
80	735
84	780

- Find the linear regression model that best fits this data.
- Find the correlations coefficient for this data.
- Use the model to predict soft drink sales if the temperature is 95 degrees F.
- What does the model predict for the temperature if the number of cans sold was only 95?