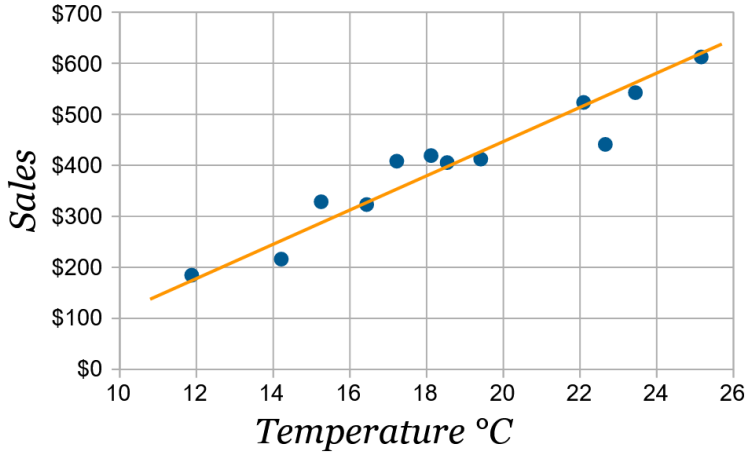
APPLICATION: Scatter Plots and Linear Regression in Finance Transactions

Level 1

Ice Cream Sales
Ari recorded the daily high temperature (in Celsius) and total sales from his ice cream shop for 12 days. He plotted the data on the graph below and drew a line of best fit.



1. **Does the data appear to have a correlation? If so, is it positive or negative?**

2. **Based on the line of best fit that Ari drew, how much money in sales should he expect when the temperature is 21℃?**

3. **In your own words, explain why it makes sense that this data has a correlation?**

4. **Create a scenario like Ari's ice cream shop that will have a negative correlation.**

Check Cashing

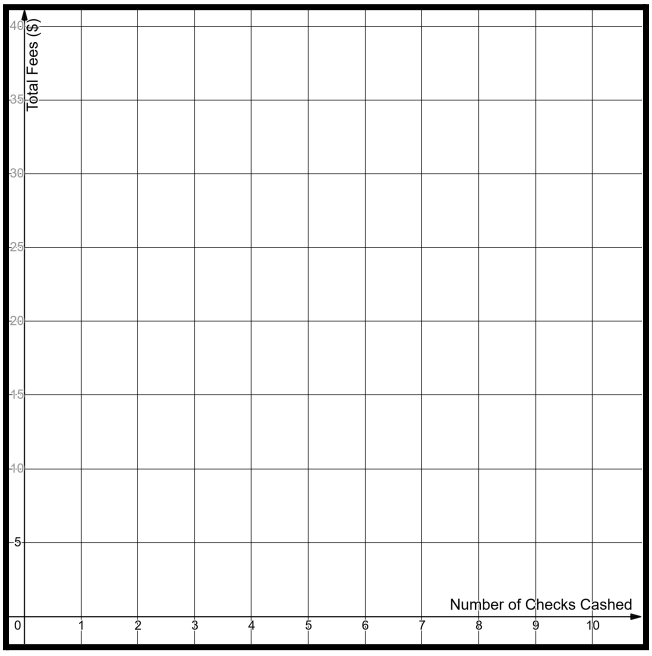
Camilla used a check cashing service to cash checks of different values.

The chart below represents the number of transactions and the total fees that Camilla paid when she cashed her checks.

Number of Checks Cashed	Total Fees ($)
2	9.50
4	18
6	31.50
9	37

Part I: Graph

1. **Graph the data on the grid below.**



Part II: Equation

2. **Launch the Desmos Graphing Calculator**

3. **Input the data above and perform a linear regression using**

$$y_1 \sim mx_1 + b$$

4. **Write an equation that represents the average fee structure of the check cashing store.**

5. **What does m represent in the context of Camilla's fees?**

6. **If Camilla continues to cash checks, what is the total fee that she will pay after cashing 20 checks?**

Part III: Reflect

After watching this video about the check cashing stores until 5:10:

7. **Why do people use check cashing services instead of traditional banking services?**

8. **Do you think that these types of businesses provide a necessary service?**

9. **What can be done to make traditional banking services more appealing to those who use check cashing services?**

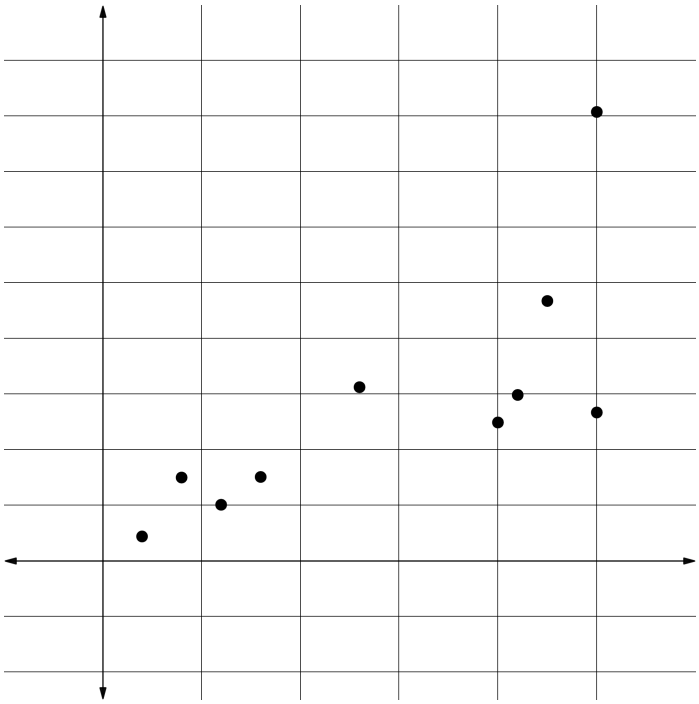
Level 3

Design your own data

You are going to take plotted data and think of a real-world scenario that could possibly have a similar distribution. You will add a title, x & y axis labels, and an x & y axis scale. Then, answer the following questions about your scenario.

For example:

Title: Avg. Number of Sunglasses Stores per Square Mile vs. Number of Beaches Within 5 Miles of a City
x-axis label: Number of Beaches Within 5 Miles
x-axis scale: 1 beach/line
y-axis label: Avg. Number of Sunglasses Stores per Square Mile
y-axis scale: 2 stores/line



1. **Explain why you thought this was a reasonable real-world scenario.**

2. **What does it mean that the 5th line in the x direction has two dots on it?**

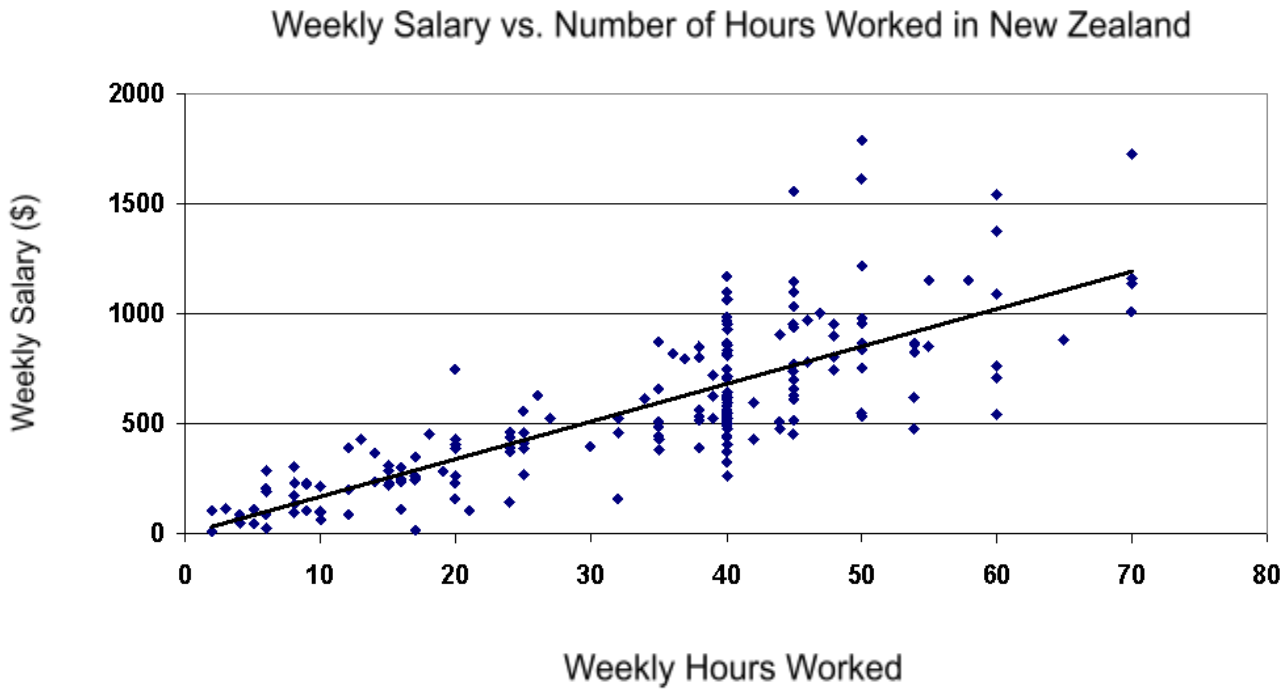
3. **Draw a line of best fit (on paper or in Desmos). Looking at your graph, write the slope-intercept form of the equation for your line of best fit.**

4. **What is the meaning of the slope for your graph?**

5. **What is the meaning of the y-intercept for your graph?**

Real World Data

The following graph comes from real world salary data from a study in New Zealand. Inspect the graph then answer the following questions.



6. **What does it mean that there are multiple different y values at 40 hours worked?**

7. **What is the approximate slope of the line of best fit drawn in this graph? What does this mean?**

8. **There is not actually a fixed increase in salary based on the number of hours worked. What does our line of best fit tell us if not exactly how salary will increase?**