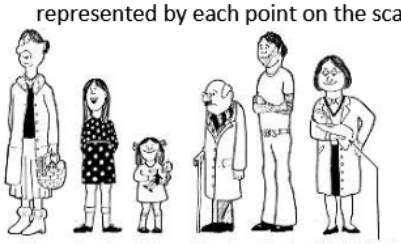
MAP4C – Two-Variable Data Name: _____ Date: _____

Two-Variable Data - REVIEW

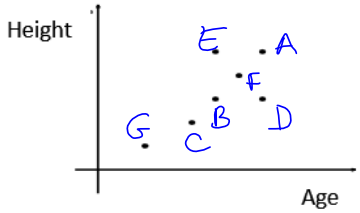
1. Define the following words:

- Correlation: a measure of the strength of the relationship between variables.
- Interpolation: Estimating values among known values on the graph
- Extrapolation: Predicting values beyond known values.

2. A number of people are lined up at the bus stop. They are represented in the graph below. Who is represented by each point on the scatter graph?



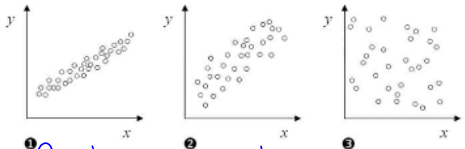
A B C D E F G



3. For each graph,

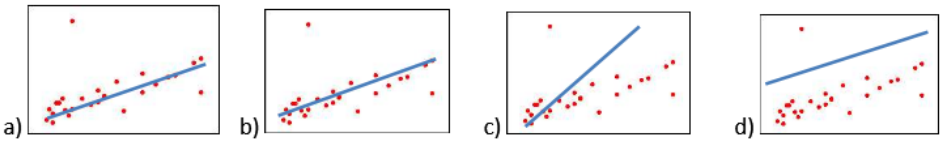
a) Does this scatter plot show a positive, a negative, or a no correlation? Explain your reasoning.
b) Label the axis with two variables that could be represented by this graph.

} Answers will vary



❶ Positive (strong)
❷ Positive (weak)
❸ No correlation

4. Identify which line of best fit represents the data. For all others, explain why they are wrong.



a) Too low (ignores the outlier completely)
b) ↑ BEST LINE
c) Doesn't follow the trend of the data
d) Too high (too much weight given to the outlier)

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5. State whether each situation involves one-variable or two-variable data. Also state whether the data is categorical, discrete or continuous.

a) James decides to ask all of his classmates how many different sports they play

One-variable data

Number of sports is discrete data

b) Jenny does an experiment to see if there is a relationship between the volume of coffee they drink (in mL) and their marks in math class.

Two-variable data

Volume of coffee and marks are both continuous.

c) Susan asks students at Newmarket HS which school subject is their favourite.

One-variable data

School subject is categorical data

6. For each of the following sets of data, identify:
   i) the Independent variable
   ii) the dependent variable
   iii) the correlation, if one exists (strength and direction)

a) Number of air conditioners sold and the average daily summer temperature.

Independent - temperature
Dependent - air conditioners sold

Weak positive correlation

b) Hours spent sleeping and hours spent awake.

Either could be considered independent / dependent.

Strong negative correlation

c) Number of applications for a job and probability that you will get the job.

Independent - numbers of applications
Dependent - probability

Strong negative correlation

d) A person's weight and the amount of time it takes them to drink 500 mL of water.

Independent - weight
Dependent - time to drink 500mL

No Correlation

e) Number of kilometres driven and total fuel cost of the trip.

Independent - km driven
Dependent - fuel cost

Strong positive correlation

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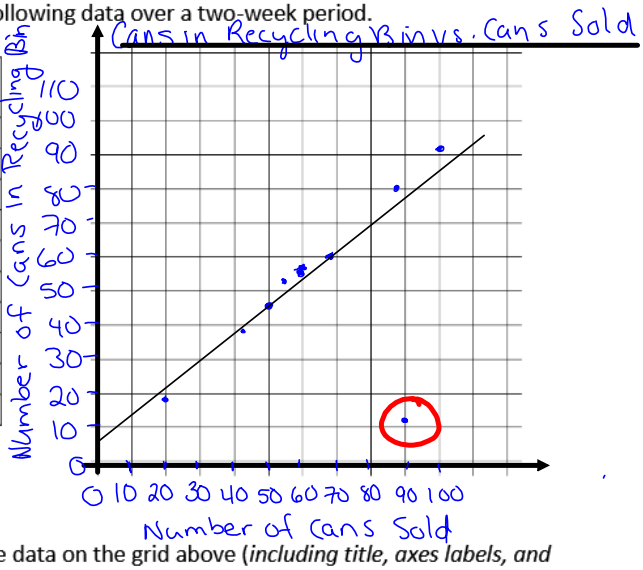
7. The Environment Club collected the following data over a two-week period.

Number of Cans Sold	Number of Cans in Recycling Bin
60	55
87	80
55	52
20	18
100	92
42	38
68	60
90	12
50	45
60	56



a) Make a well-labeled scatter plot of the data on the grid above (*including title, axes labels, and appropriate scales.*)

b) Circle the "outlier" on your scatter plot.

c) Describe the relationship between the number of cans sold and the number of cans recycled.

As more cans are sold, more cans are recycled.
⇒ Strong Positive Correlation.

d) Sketch a line-of-~~best~~-fit on the scatter plot.

e) Algebraically determine the equation of the ~~time~~ line of best fit.

(68, 60)
(50, 45)

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{60-45}{68-50} = \frac{15}{18} = 0.83$

$y = mx + b$

$b = 7$

$y = 0.83x + 7$

f) Using the graphing calculators determine the equation of the line of best fit.

$y = 0.56x + 15.33$

This is much more accurate than the one we calculated. It's hard to know how much effect the outlier will have.

g) Using your graphing calculator equation of ~~your~~ line-of-best-fit, determine how many cans would you expect to be in the recycling bin if 70 cans of pop are sold? Also, indicate this on your graph.

$y = 0.56x + 15.33$
$y = 0.56(70) + 15.33$
$y = 39.2 + 15.33$
$y = 54.53$

We expect 55 cans in the recycling bin.