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REVIEW – CHAPTER 3

3.1 – TWO-VARIABLE DATA SETS

1. For each situation, determine whether the data represents **one-variable** or **two-variable** data and justify your answer

	ONE-VARIABLE or TWO VARIABLE	***EXPLANATION***
(a) A class surveys Grade 12 students on their time spent watching TV and using a computer		
(b) A market research company compiles data on the number of laptops sold by each computer company		
(c) A group of friends records the distance travelled by car and the volume of gas used when they go on vacation		
(d) A pharmacy manager records the volume of shampoo sold from each shampoo company		

2. Michelle researched some of the languages commonly spoken in Ontario. She found this information

LANGUAGE	***NUMBER OF ONTARIO SPEAKERS (in 100000s)***	***FREQUENCY***
English	𝍸 ||	
French	𝍸	
Chinese languages	||||	
Italian	||	
Portuguese	|	

(a) Complete the table above by converting each tally to its correct frequency

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(b) What do you know about each language?

(c) Is this a **one** or **two-variable** data set? Explain.

(d) Identify the **variable(s)**

3. Aidan researched the time Canadians spend watching Canadian and foreign TV programs. The information is presented on the chart on the right

(a) What do you know about each type of programming?

(b) To help Aidan analyse the data, what type of graph would be appropriate? Explain.

(c) Pose a question that would require **one-variable** data analysis

(d) Pose a question that would require **two-variable** data analysis

Type of Television Program	Canadian Programs (% of viewing time)	Foreign Programs (% of viewing time)
News	18.4	6.0
Documentary	1.3	1.9
Academic instruction	1.7	1.5
Social and/or recreational instruction	0.4	0.6
Religion	0.2	0.1
Sports	2.9	3.6
Variety and games	4.6	10.7
Music and dance	0.8	0.2
Comedy	1.6	8.4
Drama	5.3	22.1
Recorded programs	0	4.9
Other	0	2.9

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3.2 – EFFECTIVE SURVEYS

1. Complete the table below by giving an example of each survey question type that would relate to an electronics company. Use the classroom notes to help you with this question.

SURVEY QUESTION TYPE	*EXAMPLE*
(a) Dichotomous	
(b) Multiple choice	
(c) Rating scale	
(d) Completion	
(e) Open ended	

2. A survey included this question:

"What choices would you like for lunch in the cafeteria?
a) deli sandwiches Y/N
b) pasta Y/N
c) salad bar Y/N
d) other
_____"

What could be changed or added to make the question more inclusive?

3. The marketing department of a large grocery store will be sending a customer service survey to all customers on their mailing list. Write two **four-question surveys** for the company – one following the principles of surveying and the other breaking the rules

FOLLOWING THE PRINCIPLES OF SURVEYING	*BREAKING THE RULES OF THE PRINCIPLES OF SURVEYING*

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4. “Mayor Royce stated last week, only three months before the next election, that he plans to finally increase salaries for city employees. He made similar claims two years ago but never followed through. Do you think he can be trusted this time?”

Describe the **bias** in the above question and **re-write** the question to **eliminate bias**

3.3 – COLLECT AND ORGANIZE DATA

1. (a) Why is data generated by the researcher through experiments or observational studies called **primary** data?

(b) What distinguishes **secondary** data from **primary** data?

2. (a) Is it possible to collect **primary** data when the population of a survey is *every* person in Canada? Explain.

(b) What are the **disadvantages** of using *secondary* data?

(c) What are the **advantages** of using *secondary* data?

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3. Explain how to change each experiment to ensure the data collected is accurate and fair

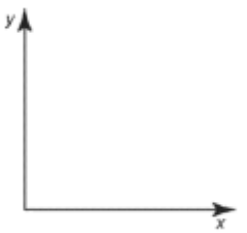
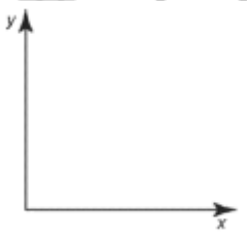
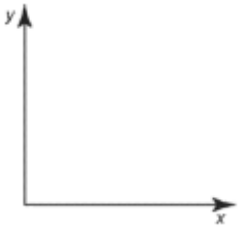
EXPERIMENT	*CHANGES TO EXPERIMENT TO ENSURE ACCURACY AND FAIRNESS*
(a) Brianna watches cars at an intersection for 10 minutes. She then estimates how many of them were red	
(b) Namond asks all the friends he sees at the food court which restaurant they like the most	

4. Using the table below, explain the relationship between the urban and rural populations of a province in 1851 and in 2001.

Year	Urban Population	Rural Population
1851	318 079	2 118 218
2001	23 908 211	6 098 883

3.4 – THE LINE OF BEST FIT

1. Sketch the general appearance of a **scatter plot** associated with each value of the **correlation coefficient, *r***

(a) r = 1	*(b) r = 0.5*	*(c) r = - 0.2*	*(d) r = - 0.9*
			

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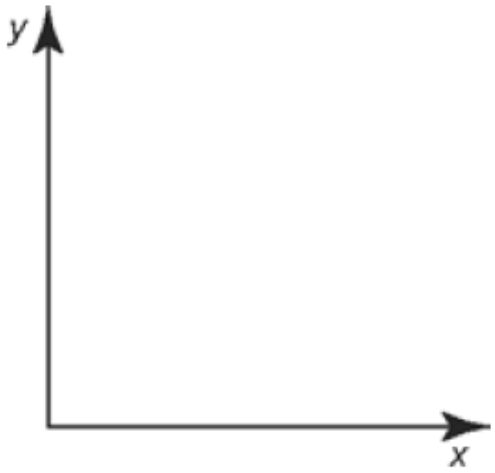
2. For each situation, indicate whether the correlation coefficient, *r*, would be **positive, negative** or **zero**

	CORRELATION COEFFICIENT (POSITIVE, NEGATIVE or ZERO)
(a) Walk speed vs. Age	
(b) Number of hours sleeping vs. Number of years going to school	
(c) Number of hours working each day vs. Amount of money spend each day for a week	
(d) Number of cups of hot chocolate sold vs. Air temperature	

3. Every year, Maggie gets two new model cars as a birthday present. The data is presented on the chart on the right.

Year	Total Number of Model Cars
1992	2
1995	8
1999	16
2002	22
2006	30
2009	36

(a) Sketch an accurate **scatter plot** of the data below



(b) Describe relationship between the variables.

(c) Use algebra to determine the equation of the **line of best fit** in the form $y = mx + b$. Use the classroom example to help you with this.

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3.5 – ANALYSIS AND CONCLUSIONS

1. For each situation below, determine if it describes a **cause and effect relationship** and provide an explanation.

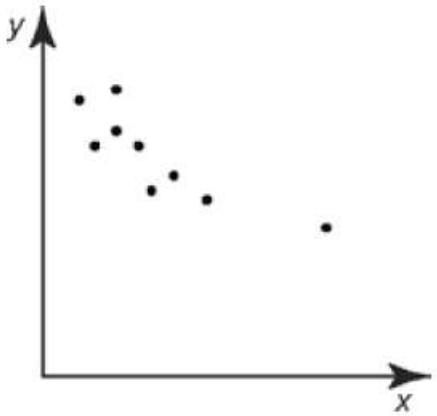
	CAUSE and EFFECT RELATIONSHIP? YES or NO	***EXPLANATION***
(a) As the price of movie tickets decreases, the number of tickets purchased increases		
(b) As the rabbit population increases, the temperature decreases		
(c) The more posters Becky puts up advertising her craft show, the more people come to the show		
(d) As a camper gets colder, she moves farther away from the campfire		

2. What is the difference between an **outlier** and an **influential point**?

Outlier:

Influential point:

3. Examine the scatter plot on the right and answer the questions below



(a) Is there a **cause and effect relationship**? _____. Explain.

(b) Is the point on the right an **outlier** or an **influential point**? _____. Explain.

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3. (continued)

(c) Draw a **line of best fit** on the graph on the previous page – one *with* the point on the right and one *without* it. Describe the line of best fit.

(d) The *x*-axis represents the amount of snowfall and the *y*-axis represents the cars on the road. Make a conclusion about this data.



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SOLUTIONS

3.1

1. (a) 2-variable, 2 different time values
   (b) 1-variable, just 1 value (laptops sold)
   (c) 2-variable, distance and volume of gas
   (d) 1-variable, just 1 value (volume of shampoo sold)

2. (a) English = 102, French = 5, Chinese = 4, Italian = 2, Portuguese = 1
   (b) Number of people in Ontario who speak the language
   (c) 1-variable, language is a category
   (d) The number of people in Ontario who speak each language

3. (a) The percent of total time spent watching Canadian and foreign programs
   (b) Double bar graph; compare all types and see the breakdown of Canadian and foreign programming
   (c) Answers may vary
   (d) Answers may vary

3.2

1. Answers may vary for each category

2. Make question open ended

3. Answers may vary

4. First part of the questions makes you question the Mayor's motives. "Do you think Mayor Royce will follow through with his plan?"

3.3

1. (a) First hand information
   (b) Secondary data is collected data made to be available and used by others

2. (a) No because population is too big. However, the Canadian Census is able to survey every Canadian
   (b) May be errors in the data (ie. Does not state how the data was gathered)
   (c) You do not have to spend your own time designing and collecting data

3. (a) Record the data
   (b) Ask random people, not just friends

4. Generally, when urban population is lower, rural population is higher in 1851. In 2001, when urban population was higher, the rural population was lower.

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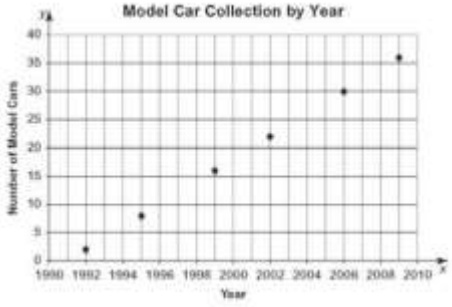
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3.4

1. (a) Scatter plot dots on the line, positive slope
   (b) Scatter plot dots near the line, positive slope
   (c) Scatter plot dots further from line, negative slope
   (d) Scatter plot dots near the line, negative slope

2. (a) Zero (b) Negative (c) Zero (d) Negative

3. (a)



   (b) As years increase, number of model cars increase by 2
   (c) $y = 2x - 3892$

3.5

1. (a) Yes, more people will buy when ticket prices are lower
   (b) No, population increase and temperature decrease have no relation
   (c) Yes, the more people that know about the craft show, more will attend
   (d) No, relationship should be in reverse (person gets colder, person would move towards the campfire)

2. Influential point follows in the pattern of the data and outlier does not

3. (a) Yes, as *x*-values increase, the *y*-values decrease
   (b) Influential point since it follows the pattern of the rest of the data
   (c) Line of best fit slopes downward. Slope would be steeper without the influential point
   (d) As snowfall increases, the number of cars on the road decrease

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