

HILLCREST HIGH SCHOOL
MATHEMATICS DEPARTMENT

Test
STATISTICS

Course: **Grade 12 Mathematics**

Name: _____

Course Code: **MDM4U**

Teacher: Miss Abi-Zeid

Date: **March 31st, 2006**

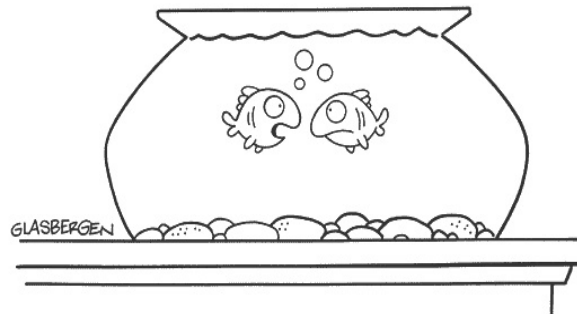
GENERAL INSTRUCTIONS:

1. Read each question carefully before answering it.
2. Answer all questions directly on the computer. **Copy all relevant tables and graphs from *Fathom* into your *Word* document.**
3. Use your time wisely. Do not spend too much time on any one question.
4. This booklet contains 3 pages.
5. Question values are shown beside each part.
6. Detailed and complete solutions are required for full marks.



ACCESS TO COMPUTER WILL BE PROVIDED.

Knowledge	TIPS	Application
/10	/8	/14



“When do they take us out to go to the bathroom?
I don’t think I can hold it much longer!”

Question #1:

[____ out of 5: Knowledge]

Open the file **question1.ftm** located under I\handout\Abi-Zeid\MDM4U\TEST\

The data shown represent the monthly rent (\$\$) in the province of Ontario. This set of data was taken from the 1991 Ontario Census.

- (a) Create a **summary table** for the monthly rent showing the following statistics: *mean, median, Q1, Q3, IQR, minimum, maximum.*
(2 points)
 - (b) Create a **box and whisker plot** representing the monthly rent. Explain, in detail, all of the information shown in the box plot. Be specific!
(3 points)
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Question #2:

[____ out of 14: Application]

Open the file **question2.ftm** located under I\handout\Abi-Zeid\MDM4U\TEST\

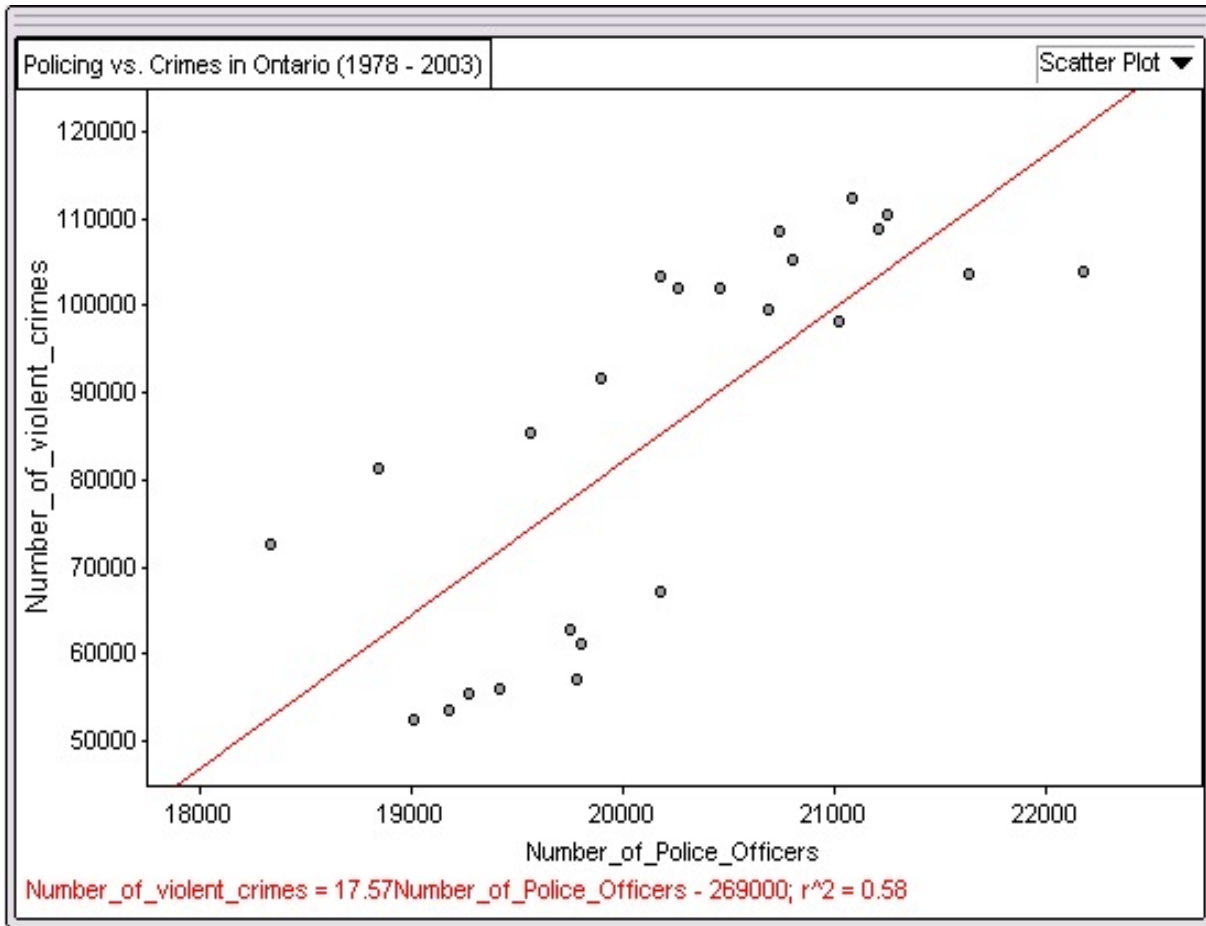
The data shown represent the average yearly earnings (\$) of Canadian male and female full-time employees from 1983 to 2003. This set of data was retrieved from Statistics Canada, table #202-0102.

- (a) What is the **ratio** of female to male earnings from 1983 to 2003? Explain the significance of this statistic. [Hint: When a man earns \$1.00, how much does a woman earn?]
(2 points)
- (b) Create a **line scatter plot** for each gender showing the percentage change in earnings over time. [Hint: Don't forget to filter out the undefined data!]
(4 points)
- (c) What is the overall **average** percentage change in male and female earnings? Explain the meaning of this statistic.
(2 points)
- (d) Have the earnings of male and female full-time employees kept up with inflation for the time period from 1983 to 2003? To answer this question, you will need to use the collection box **CPI (base year: 1992=100)**. Perform all necessary calculations to justify your reasoning.
(4 points)
- (e) The average earnings of male and female full-time employees for 2003 in *Ottawa-Gatineau* are \$56,200 and \$47,600, respectively. How do these regional earnings relate to the *national* distribution of earnings?
(2 points)

Question #3:

[____ out of 3: TIPS]

Based on the “Policing vs. Crimes in Ontario (1978-2003)” graph shown below, can you conclude with confidence that as the number of police officers increases, so does the number of violent crimes? **Justify your reasoning.**



Question #4:

[____ out of 5: Knowledge]

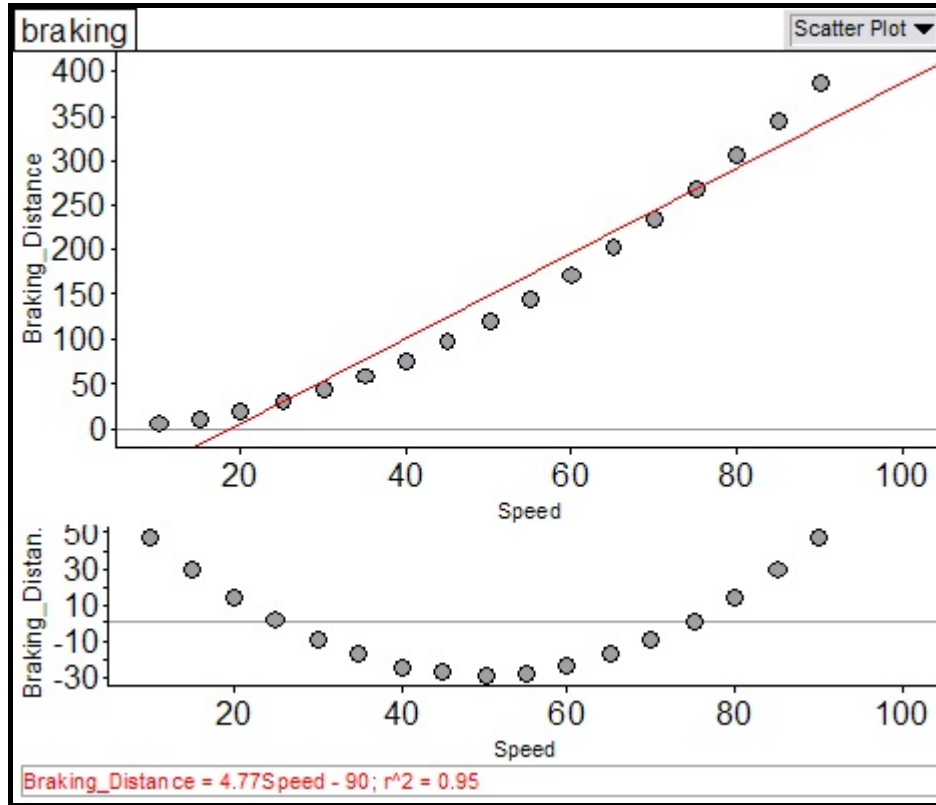
Open the file **question4.ftm** located under I\handout\Abi-Zeid\MDM4U\TEST\

The data shown represent the number of births between 1950 and 1967, also known as the *Baby Boom*. Create an appropriate mathematical model **using sliders**.

Question #5:

[____ out of 2: TIPS]

The graph shown below represents the relationship between braking distance and speed of car. The information is based on full braking, on dry, level asphalt, with an average perception-reaction time of 1.5 seconds. Braking distance is measured in feet, and speed is measured in miles per hour.



Comment on the “goodness of fit” (appropriateness) of the model chosen to fit the data. What type of model should have been used instead? **Justify your reasoning.**

Question #6:

[____ out of 3: TIPS]

Open the file **question6.ftm** located under I\handout\Abi-Zeid\MDM4U\TEST\

The data shown represent the daily high temperature for the months of February and April. The temperature is recorded in degrees Celsius.

- (a) Calculate the **mean** temperature and the **standard deviation** for each month. **(1 point)**
- (b) In general, how does the standard deviation affect the interpretation of the mean temperature? (i.e., How well does the mean describe a “typical” day in February? How well does the mean describe a “typical” day in April?) **(2 points)**