# Self-Assessment for Grade 12 Data Management (MDM4U)

Students who are registered for Grade 12 Data Management (MDM4U) may benefit from this self evaluation and review of the following expectations from previous grades.

The Data Management course consists of two main themes: Probability and Statistics. While students must have completed either Grade 11 Functions and Applications (MCF3M) or Grade 11 Functions (MCR3U), the topics in these courses are not directly connected to the topics in Data Management. The following suggestions for self evaluation are based on content from previous courses and from general problem solving.

The questions in this self-assessment reflect some of the key ideas learned in prerequisite courses. They do not represent the problem solving approach or the rich experience that students would be exposed to in a classroom. The intention is for students to revisit some key concepts and, if needed, access review materials in an informal environment at a pace that is comfortable for the student.

| Concept(s) | Sample Question | How comfortable do you feel with this concept? | Link(s) to explore concept further |
|---|---|---|---|
| **I can estimate the likelihood of events** | 1. Sort the following events from least likely to most likely<br>● A person wearing contacts or glasses to correct vision some time in their lives<br>● A golfer sinking a "hole-in-one"<br>● A ticket having all 6 winning numbers in the next lotto 6-49<br>● Being struck by lightning this year<br>● A person randomly selected from anywhere in the world is a billionaire |  ☐ Very comfortable<br><br>☐ Somewhat comfortable<br><br>☐ Not at all comfortable | |

| | | | |
|---|---|---|---|
| **I can calculate simple probabilities** | 2. If you roll a fair six-sided standard die, what is the probability that you will roll:<br>    a) A four?<br>    b) An even number? | ☐ Very comfortable<br><br>☐ Somewhat comfortable<br><br>☐ Not at all comfortable | Independent and Dependent Events |
| **I can determine the probability of independent events** | 3. If you flip a coin and then roll a fair six sided die, what is the probability that you will get a tail and a number greater than 4? | ☐ Very comfortable<br><br>☐ Somewhat comfortable<br><br>☐ Not at all comfortable | Independent Events |
| **I can interpolate/extrapolate using data in a scatter plot.** | 4. Consider the following graph.<br>Salary vs. Years of Experience | ☐ Very comfortable<br><br>☐ Somewhat comfortable<br><br>☐ Not at all comfortable | Making Predictions on a Scatter Plot Using Interpolation and Extrapolation |

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|---|---|---|---|
| | a)  Draw a line on the graph that would approximate a line of best fit.<br>b) Based on your line, if a person has an annual salary of $60 000, how many years of experience would this person have? | | |
| **I can find the measures of central tendency and the range in a set of data** | 5. A playlist contains 8 songs.  The length, in seconds, of each song is provided.<br>160  161  138  255  176  160  172  162<br>      a) Determine the mean, median, and mode of the data.<br>      b) Determine the range in the data. | ☐ Very comfortable<br><br>☐ Somewhat comfortable<br><br>☐? Not at all comfortable | Mean, median, & mode example |

Students who take Data Management may find it useful to have a working knowledge of spreadsheets.  The following tutorials will provide an introduction to Google Sheets.

Intro to Google Sheets:  Google Sheets - Full Tutorial
Create graphs in Google Sheets: Add & edit a chart or graph

# Solutions to Sample Questions

1. Sort the following events from least likely to most likely
   - **A ticket having all 6 winning numbers in the next lotto 6-49 (about 1 in 14 000 000)**
   - **A person randomly selected from anywhere in the world is a billionaire (about 1 in 2 800 000)**
   - **Being struck by lightning this year (about 1 in 700 000)**
   - **A golfer sinking a "hole-in-one" (about 1 in 11 000)**
   - **A person wearing contacts or glasses to correct vision some time in their lives (about 1 in 2)**

2. If you roll a fair six-sided standard die, what is the probability that you will roll:
   a) A four? **Since there are 6 different numbers and only one 4, the probability is 1/6**
   b) An even number? **Since there are 6 different numbers of which 3 are even, the probability is 3/6 or 1/2**

3. If you flip a coin and then roll a fair six sided die, what is the probability that you will get a tail and a number greater than 4?

```
                    1    H1
                    2    H2
                    3    H3
        H           4    H4
                    5    H5
                    6    H6

                    1    T1
                    2    T2
                    3    T3
        T           4    T4
                    5   (T5)
                    6   (T6)
```
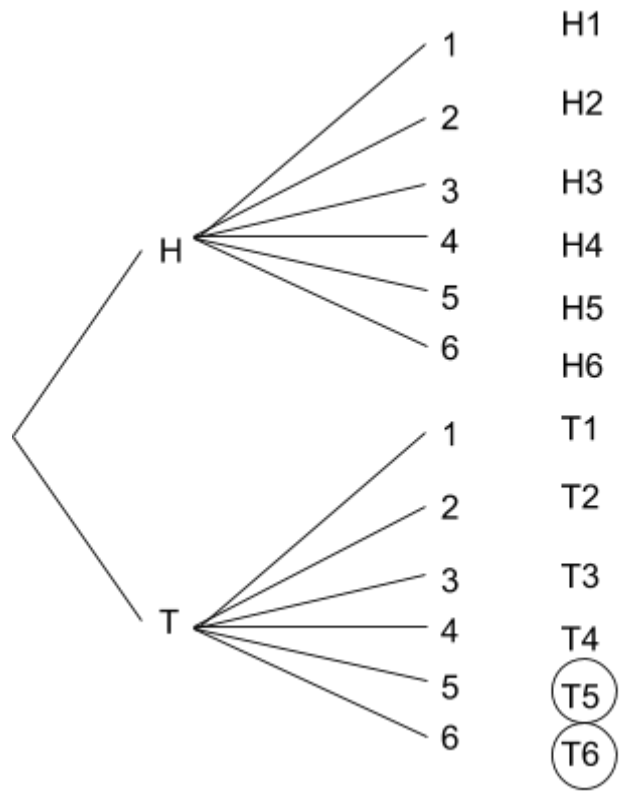
So the probability is $\dfrac{2}{12}$ or $\dfrac{1}{6}$

4. Consider the following graph.

Salary vs. Years of Experience

a) Draw a line on the graph that would approximate a line of best fit. (**See graph**)

b) Based on your line, if a person has an annual salary of $60 000, how many years of experience would this person have? **About 11 years based on the line above. Answers may vary.**

5. A playlist contains 8 songs. The length, in seconds, of each song is provided.

160  161  138  255  176  160  172  162

a) Determine the mean, median, and mode of the data.

**Mean: 173 seconds**

**Median: 161.5 seconds**

**Mode: 160 seconds**

b) Determine the range in the data. **The range is $255 - 138 = 117$ seconds**.