

Review of Prerequisite Skills

If you need help with any of the skills named in purple below, refer to Appendix A.

1. Graphing exponential functions

a) Graph the following functions:

i) $y = 10^{-x}$

ii) $y = 10^{-2x}$

iii) $y = 10^{-\frac{x}{2}}$

b) Determine the y -intercepts of each function in part a).

c) For $x > 0$, which function has

- i) the largest area under its curve?
- ii) the smallest area under its curve?

2. **Representing data (Chapter 2)** During July, a local theatre recorded the following numbers of patrons per day over a 30-day period.

102	116	113	132	128	117	156	182
183	171	160	140	154	160	122	187
185	158	112	145	168	187	117	108
171	171	156	163	168	182		

- a) Construct a histogram of these data.
- b) Determine the mean and standard deviation of these data.
- c) Construct a box-and-whisker plot of these data.

3. Summary measures for data (Chapter 2)

Fifteen different cars were tested for stopping distances at a speed of 20 km/h. The results, in metres, are given below.

15	18	18	20	22	24	24	26
18	26	24	16	23	24	30	

- a) Find the mean, median, and mode of these data.
- b) Construct a box-and-whisker plot of these data.
- c) Find the standard deviation of these data.

4. Summary measures for data (Chapter 2)

Analyse the following data, which represent the numbers of e-mail messages received by 30 executives on a Wednesday.

22	14	12	9	54	12	16	12	14
49	10	14	8	21	31	37	28	36
22	9	33	59	31	41	19	28	52
22	7	24						

5. **Summary measures for data (Chapter 2)** An insurance bureau listed the ratio of registered vehicles to cars stolen for selected towns and cities in Ontario. The results for a recent year were as follows:

50	38	53	56	69	90	94	88
58	68	78	89	89	52	50	70
83	98	91	90	90	84	80	70
83	89	79	75	78	73	92	105
100							

Analyse these data and write a brief report of your findings.

6. **Scatter plots** The table below gives the depreciation (loss in value) of a new car for each year of ownership. Construct a scatter plot of the depreciation of this car.

Year of Ownership	Depreciation by End of Year
1	30%
2	20%
3	18%
4	15%
5	15%
6–9	10% per year
10	5%

7. **Scatter plots** The table below gives data on the planets in our solar system.

Planet	Mean Distance From the Sun (AU)	Time for One Revolution (years)
Mercury	0.387	0.241
Venus	0.723	0.615
Earth	1.000	1.000
Mars	1.523	1.881
Jupiter	5.203	11.861
Saturn	9.541	29.457
Uranus	19.190	84.008
Neptune	30.086	164.784
Pluto	39.507	248.350

- Construct a scatter plot of these data.
 - Construct a line of best fit for these data.
 - Explore whether a curve would be a better approximation for this relationship.
 - Find out what Kepler's third law states, and investigate it using the data provided.
8. **Z-scores (section 2.6)** The mean age of the viewers of a popular quiz show is 38.3 years with a standard deviation of 12.71 years.
- What is the z -score of a 25-year-old viewer?
 - What is the z -score of a 70-year-old viewer?
 - What is the z -score of a 40-year-old viewer?
 - What age range is within 1 standard deviation of the mean?
 - What age range is within 2 standard deviations of the mean?
 - What age range is within 1.3 standard deviations of the mean?
9. **Z-scores (section 2.6)** On a recent grade-11 mathematics contest, the mean score was 57.9 with a standard deviation of 11.6. On the grade-10 mathematics contest written at the same time, the mean score was 61.2 with a standard deviation of 11.9. Gavin scored 84.3 on the grade-11 contest and his sister, Patricia, scored 86.2 on the grade-10 contest. Explain why Gavin's results could be considered better than his sister's.
10. **Binomial distribution (Chapter 7)** According to Statistics Canada, about 85% of all Canadian households own a VCR. Twelve people were selected at random.
- What is the probability that exactly 8 of them own a VCR?
 - What is the probability that no more than 8 of them own a VCR?
 - What is the probability that at least 8 of them own a VCR?
 - How many of them would you expect to own a VCR?
11. **Geometric distribution (section 7.3)** If you program a calculator to generate random integers between -4 and 10 , what is
- the probability that the first zero will not occur until the 6th number generated?
 - the probability that the first odd number will be generated within the first 5 numbers?
 - the expected waiting time before a negative number is generated?