

Section 1:

1. Simplify $3 + \frac{10}{3} \div \frac{2}{3} + \frac{1}{8} \times 2\frac{2}{3}$

2. Solve for x: $x^2 - 10x = -21$

3. The expression $y = x^2 + x + 1$ is:
- a) Always positive
 - b) Always zero
 - c) Always negative
 - d) Sometimes positive, sometimes negative

4. Solve for x: $|x + 1| = 2x - 3$

5. Find the equation of the line that passes through the point (1, 2) and is perpendicular to the line $2x - 3y = 4$.

6. Solve: $\log_3(x + 3) + \log_3 2 = 2$

7. Evaluate the expression:

$$\sum_{n=2}^5 n^3 - 5$$

8. Leif is 3 less than twice Aziz's age. 4 years from now, Sandra will be 2 more than twice Aziz's age. 5 years ago, Sandra was three times Aziz's age. How old was Leif 5 years ago?

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Section 2:

- Graph the following function: $y = 2x^2 - 3x - 2$
- Write a short essay outlining any significant information that you can extract from the following tables (min. 250 words, max. 500 words).

The following figures were excerpted from: Statistics Canada, Aboriginal Peoples Survey, 2017.

Chart 1: Employment rate of First Nations people living off reserve, Canada (data in: %)

	25 to 34 years	35 to 44 years	45 to 54 years
Men	71.7	73.8	67.2
Women	62.9	64.4	63.0

Chart 2: Self reported reason for working less than 30 hour per week, First Nations people employed part-time aged 25 to 54 years (data in: %)

Reason for working part-time	Percent
Own illness or disability	7.5
Caring for family member	15.2
Going to school	13.1
Involuntary part-time	36.9
Personal preference	9.3
Other reasons	18.1

Chart 3: Employment rate by highest level of schooling and sex, First Nations people aged 25 to 54 years (data in: %)

Highest level of schooling	Men	Women
University certificate, diploma or degree at bachelor's level or above	92.6	91.3
University certificate or diploma below bachelor's level	65	81.0
College/CEGEP/other non-university certificate/diploma or degree	78.1	73.9
Apprenticeship or trades certificate or diploma	78.0	65.4
Some postsecondary	70.0	57.0
Secondary (high) school diploma or equivalent	67.7	57.0
No certificate, diploma or degree	50.4	23.9

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**Chart 4: Top 5 industries of employed First Nations men living off reserve, aged 25 to 54 years
(data in: %)**

Industry	Percent
Construction	17.1
Public administration	9.1
Manufacturing	8.8
Retail Trade	7.7
Transportation and Warehousing	7.7

**Chart 5: Top 5 industries of employed First Nations women living off reserve, aged 25 to 54
years (data in: %)**

Industry	Percent
Health care and social assistance	23.7
Retail Trade	10.7
Educational services	10.2
Public administration	9.8
Accommodation and food services	8.3

Section 3:

1. While many people think of the lottery as a harmless way to have fun and possibly win some money, buying lottery tickets is a form of gambling. Therefore, public officials shouldn't buy lottery tickets.

The argument above relies upon which of the following assumptions?

- a) Individuals who play the lottery are less likely to win a big payout than they are to be killed in a car crash.
- b) Some public officials are guilty of much more serious offenses than gambling.
- c) Public officials shouldn't gamble.
- d) Many public officials are easily tempted to violate rules governing their positions.
- e) Most lottery winners are not made as happy by their winnings as they expected.

2. *The following group of questions (Q1 – Q3) is based on different sets of **conditions** (below). Drawing a simple diagram may be helpful in answering some of the questions.*

A producer is positioning exactly seven music pieces – F, G, H, J, K, L and M – one after another on a music recording, not necessarily in that order. Each piece will fill exactly one of the seven sequential tracks on the recording, according to the following conditions:

- **F must be second;**
- **J cannot be seventh;**
- **G can come neither immediately before, nor immediately after H;**
- **H must be in some track before that of L;**
- **L must be in some track before that of M.**

Based on these **conditions**, determine the answers to the following questions:

- a) What is the earliest track that M can fill?
- b) If H is placed fifth, and K is placed third, what are all of the possible positions for G?
- c) What are all of the possible sequences starting with K followed by F then G?