Mathematics 12

Outcomes

NOVA SCOTIA
NOUVELLE-ÉCOSSE

2022

Mathematics Grade 12 Outcomes

FM01 Solve problems that involve compound interest in financial decision making.

Performance Indicators:
FM01.01 Explain the advantages and disadvantages of compound interest and simple interest.
FM01.02 Identify situations that involve compound interest.
FM01.03 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods.
FM01.04 Determine, given the principal, interest rate, and number of compounding periods, the total interest of a loan.
FM01.05 Graph and describe the effects of changing the value of one of the variables in a situation that involves compound interest.
FM01.06 Determine, using technology, the total cost of a loan under a variety of conditions (e.g., different amortization periods, interest rates, compounding periods, and terms).
FM01.07 Compare and explain, using technology, different credit options that involve compound interest, including bank and store credit cards and special promotions.
FM01.08 Solve a contextual problem that involves compound interest.

FM02 Analyze costs and benefits of renting, leasing and buying.

Performance Indicators:
FM02.01 Identify and describe examples of assets that appreciate or depreciate.
FM02.02 Compare, using examples, renting, leasing and buying.
FM02.03 Justify, for a specific set of circumstances, if renting, buying, or leasing would be advantageous.
FM02.04 Solve a problem involving renting, leasing, or buying
FM02.05 Solve, using technology, a contextual problem that involves cost-and-benefit analysis.

FM03 Analyze an investment portfolio in terms of:
- interest rate
- rate of return
- total return.

Performance Indicators:
FM03.01 Determine and compare the strengths and weaknesses of two or more portfolios.

FM03.02 Determine, using technology, the total value of an investment when there are regular contributions to the principal.

FM03.04 Apply the Rule of 72 to solve investment problems, and explain the limitations of the rule.

FM03.05 Determine, using technology, possible investment strategies to achieve a financial goal.

FM03.06 Explain the advantages and disadvantages of long-term and short-term investment options.

FM03.07 Explain, using examples, why smaller investments over a longer term may be better than larger investments over a shorter term.

FM03.08 Solve an investment problem.

LR01 Analyze puzzles and games that involve numerical and logical reasoning, using problem-solving strategies.

Performance Indicators:
LR01.01 Determine, explain, and verify a strategy to solve a puzzle or to win a game; for example, guess and check look for a pattern, make a systematic list, draw or model eliminate possibilities, simplify the original problem, work backward, develop alternative approaches

LR01.02 Identify and correct errors in a solution to a puzzle or in a strategy for winning a game.

LR02 Solve problems that involve the application of set theory.

Performance Indicators:
LR02.01 Provide examples of the empty set, disjoint sets, subsets, and universal sets in context, and explain the reasoning.

LR02.02 Organize information such as collected data and number properties using graphic organizers, and explain the reasoning.

LR02.03 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation.

LR02.04 Determine the elements in the complement, the intersection, or the union of two sets.

LR02.05 Explain how set theory is used in applications such as Internet searches, database queries, data analysis, games, and puzzles.

LR02.06 Identify and correct errors in a given solution to a problem that involves sets.

LR02.07 Solve a contextual problem that involves sets, and record the solution, using set notation.

P01 Interpret and assess the validity of odds and probability statements.

Performance Indicators:

P01.01 Provide examples of statements of probability and odds found in fields such as media, biology, sports, medicine, sociology, and psychology.

P01.02 Explain, using examples, the relationship between odds (part-part) and probability (part-whole).

P01.03 Express odds as a probability and vice versa.

P01.04 Determine the probability of, or the odds for and against, an outcome in a situation.

P01.05 Explain, using examples, how decisions may be based on probability or odds and on subjective judgments.

P01.06 Solve a contextual problem that involves odds or probability.

P03 Solve problems that involve the probability of two events.

Performance Indicators:

P03.01 Compare, using examples, dependent and independent events.

P03.02 Determine the probability of an event, given the occurrence of a previous event.

P03.03 Determine the probability of two dependent or two independent events.

P03.04 Create and solve a contextual problem that involves determining the probability of dependent or independent events.

P04 Solve problems that involve the fundamental counting principle.

Performance Indicators:

P04.01 Represent and solve counting problems, using a graphic organizer.

P04.02 Generalize the fundamental counting principle, using inductive reasoning.

P04.03 Identify and explain assumptions made in solving a counting problem.

P04.04 Solve a contextual counting problem, using the fundamental counting principle, and explain the reasoning.

P05 Solve problems that involve permutations (It is intended that circular permutations not be included).

Performance Indicators:

P05.01 Represent the number of arrangements of n elements taken n at a time, using factorial notation.

P05.02 Determine, with or without technology, the value of a factorial.

P05.03 Simplify a numeric or algebraic fraction containing factorials in both the numerator and denominator.

P05.05 Determine the number of permutations of n elements taken r at a time.

P05.06 Determine the number of permutations of n elements taken n at a time where some elements are not distinct.

P05.07 Explain, using examples, the effect on the total number of permutations of n elements when two or more elements are identical.

P05.08 Generalize strategies for determining the number of permutations of n elements taken r at a time.

P05.09 Solve a contextual problem that involves probability and permutations.

P06 Solve problems that involve combinations.

Performance Indicators:

P06.01   Explain, using examples, why order is or is not important when solving problems that involve permutations or combinations.
P06.02   Determine the number of combinations of *n* elements taken *r* at a time.
P06.03   Generalize strategies for determining the number of combinations of *n* elements taken *r* at a time.
P06.04   Solve a contextual problem that involves combinations and probability.

RF01 Represent data, using polynomial functions (of degree ≤ 3), to solve problems.

Performance Indicators:

RF01.01   Describe, orally and in written form, the characteristics of polynomial functions by analyzing their graphs.
RF01.02   Describe, orally and in written form, the characteristics of polynomial functions by analyzing their equations.
RF01.03   Match equations in a given set to their corresponding graphs.
RF01.04   Graph data and determine the polynomial function that best approximates the data.
RF01.05   Interpret the graph of a polynomial function that models a situation, and explain the reasoning.
RF01.06   Solve, using technology, a contextual problem that involves data that is best represented by graphs of polynomial functions, and explain the reasoning.

RF02 Represent data, using exponential and logarithmic functions, to solve problems.

Performance Indicators:

RF02.01   Describe, orally and in written form, the characteristics of exponential or logarithmic functions by analyzing their graphs.
RF02.02   Describe, orally and in written form, the characteristics of exponential or logarithmic functions by analyzing their equations.
RF02.03   Match equations in a given set to their corresponding graphs.
RF02.04   Graph data and determine the exponential or logarithmic function that best approximates the data.
RF02.05   Interpret the graph of an exponential or logarithmic function that models a situation, and explain the reasoning.
RF02.06   Solve, using technology, a contextual problem that involves data that is best represented by graphs of exponential or logarithmic functions, and explain the reasoning.

RF03 Represent data, using sinusoidal functions, to solve problems.

Performance Indicators:

RF03.01   Demonstrate an understanding of angles expressed in degrees and radians.
RF03.02   Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs.

RF03.03 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations.

RF03.04 Match equations in a given set to their corresponding graphs.

RF03.05 Graph data and determine the sinusoidal function that best approximates the data.

RF03.06 Interpret the graph of a sinusoidal function that models a situation, and explain the reasoning. Solve, using technology, a contextual problem that involves data that is best represented by graphs of sinusoidal functions, and explain the reasoning.