**Math 12 Midterm Review**

**Answer Section**

**MULTIPLE CHOICE**

**1.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 1.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest.

TOP: Simple interest KEY: simple interest | principal | future value

**2.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 1.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest.

TOP: Simple interest KEY: simple interest | principal

**3.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 1.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest.

TOP: Simple interest KEY: simple interest | principal | rate of return

**4.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 1.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest.

TOP: Simple interest KEY: simple interest | principal | future value

**5.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 1.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest.

TOP: Simple interest KEY: simple interest | principal | future value

**6.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 1.2

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest.

TOP: Exploring compound interest

KEY: simple interest | compound interest | principal | future value

**7.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 1.3

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Compound interest: future value KEY: compound interest | compounding period

**8.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 1.3

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Compound interest: future value KEY: compound interest | compounding period

**9.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 1.3

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Compound interest: future value KEY: compound interest | compounding period

**10.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 1.3

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Compound interest: future value KEY: compound interest | principal | future value

**11.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 1.3

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Compound interest: future value KEY: compound interest | principal | future value

**12.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 1.3

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Compound interest: future value

KEY: compound interest | principal | future value | Rule of 72

**13.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 1.3

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Compound interest: future value

KEY: compound interest | principal | future value | Rule of 72

**14.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 1.4

OBJ: 1.2 Identify situations that involve compound interest. | 1.8 Solve a contextual problem that involves compound interest. TOP: Compound interest: present value

KEY: compound interest | future value | present value

**15.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 1.5

OBJ: 3.2 Determine, using technology, the total value of an investment when there are regular contributions to the principal. | 3.5 Determine, using technology, possible investment strategies to achieve a financial goal. | 3.8 Solve an investment problem.

TOP: Investments involving regular payments

KEY: compound interest | future value

**16.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 1.5

OBJ: 3.2 Determine, using technology, the total value of an investment when there are regular contributions to the principal. | 3.5 Determine, using technology, possible investment strategies to achieve a financial goal. | 3.8 Solve an investment problem.

TOP: Investments involving regular payments

KEY: compound interest | future value

**17.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 1.5

OBJ: 3.2 Determine, using technology, the total value of an investment when there are regular contributions to the principal. | 3.5 Determine, using technology, possible investment strategies to achieve a financial goal. | 3.8 Solve an investment problem.

TOP: Investments involving regular payments

KEY: compound interest | future value

**18.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 1.5

OBJ: 3.2 Determine, using technology, the total value of an investment when there are regular contributions to the principal. | 3.5 Determine, using technology, possible investment strategies to achieve a financial goal. | 3.8 Solve an investment problem.

TOP: Investments involving regular payments

KEY: compound interest | future value

**19.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 1.5

OBJ: 3.2 Determine, using technology, the total value of an investment when there are regular contributions to the principal. | 3.5 Determine, using technology, possible investment strategies to achieve a financial goal. | 3.8 Solve an investment problem.

TOP: Investments involving regular payments

KEY: compound interest | future value

**20.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 1.6

OBJ: 3.1 Determine and compare the strengths and weaknesses of two or more portfolios. | 3.2 Determine, using technology, the total value of an investment when there are regular contributions to the principal. | 3.3 Graph and compare the total value of an investment with and without regular contributions. | 3.4 Apply the Rule of 72 to solve investment problems, and explain the limitations of the rule. | 3.5 Determine, using technology, possible investment strategies to achieve a financial goal. | 3.6 Explain the advantages and disadvantages of long-term and short-term investment options. | 3.7 Explain, using examples, why smaller investments over a longer term may be better than larger investments over a shorter term. | 3.8 Solve an investment problem.

TOP: Solving investment portfolio problems

KEY: compound interest | principal | future value | portfolio

**21.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 1.6

OBJ: 3.1 Determine and compare the strengths and weaknesses of two or more portfolios. | 3.2 Determine, using technology, the total value of an investment when there are regular contributions to the principal. | 3.3 Graph and compare the total value of an investment with and without regular contributions. | 3.4 Apply the Rule of 72 to solve investment problems, and explain the limitations of the rule. | 3.5 Determine, using technology, possible investment strategies to achieve a financial goal. | 3.6 Explain the advantages and disadvantages of long-term and short-term investment options. | 3.7 Explain, using examples, why smaller investments over a longer term may be better than larger investments over a shorter term. | 3.8 Solve an investment problem.

TOP: Solving investment portfolio problems

KEY: compound interest | principal | future value | portfolio | rate of return

**22.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 2.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.4 Determine, given the principal, interest rate and number of compounding periods, the total interest of a loan. | 1.5 Graph and describe the effects of changing the value of one of the variables in a situation that involves compound interest. | 1.6 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. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Analyzing loans KEY: loans

**23.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 2.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.4 Determine, given the principal, interest rate and number of compounding periods, the total interest of a loan. | 1.5 Graph and describe the effects of changing the value of one of the variables in a situation that involves compound interest. | 1.6 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. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Analyzing loans KEY: loans

**24.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.4 Determine, given the principal, interest rate and number of compounding periods, the total interest of a loan. | 1.5 Graph and describe the effects of changing the value of one of the variables in a situation that involves compound interest. | 1.6 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. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Analyzing loans KEY: loans

**25.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 2.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.4 Determine, given the principal, interest rate and number of compounding periods, the total interest of a loan. | 1.5 Graph and describe the effects of changing the value of one of the variables in a situation that involves compound interest. | 1.6 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. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Analyzing loans KEY: loans

**26.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.4 Determine, given the principal, interest rate and number of compounding periods, the total interest of a loan. | 1.5 Graph and describe the effects of changing the value of one of the variables in a situation that involves compound interest. | 1.6 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. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Analyzing loans KEY: mortgages

**27.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 2.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.4 Determine, given the principal, interest rate and number of compounding periods, the total interest of a loan. | 1.5 Graph and describe the effects of changing the value of one of the variables in a situation that involves compound interest. | 1.6 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. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Analyzing loans KEY: mortgages

**28.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 2.2

OBJ: 1.2 Identify situations that involve compound interest. | 1.7 Compare and explain, using technology, different credit options that involve compound interest, including bank and store credit cards and special promotions | 1.8 Solve a contextual problem that involves compound interest.

TOP: Exploring credit card use KEY: credit cards

**29.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 2.2

OBJ: 1.2 Identify situations that involve compound interest. | 1.7 Compare and explain, using technology, different credit options that involve compound interest, including bank and store credit cards and special promotions | 1.8 Solve a contextual problem that involves compound interest.

TOP: Exploring credit card use KEY: credit cards

**30.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.3

OBJ: 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.4 Determine, given the principal, interest rate and number of compounding periods, the total interest of a loan. | 1.5 Graph and describe the effects of changing the value of one of the variables in a situation that involves compound interest. | 1.7 Compare and explain, using technology, different credit options that involve compound interest, including bank and store credit cards and special promotions. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Solving problems involving credit KEY: lines of credit | loans

**31.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 2.3

OBJ: 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.4 Determine, given the principal, interest rate and number of compounding periods, the total interest of a loan. | 1.5 Graph and describe the effects of changing the value of one of the variables in a situation that involves compound interest. | 1.7 Compare and explain, using technology, different credit options that involve compound interest, including bank and store credit cards and special promotions. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Solving problems involving credit KEY: credit cards | lines of credit

**32.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 2.3

OBJ: 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.4 Determine, given the principal, interest rate and number of compounding periods, the total interest of a loan. | 1.5 Graph and describe the effects of changing the value of one of the variables in a situation that involves compound interest. | 1.7 Compare and explain, using technology, different credit options that involve compound interest, including bank and store credit cards and special promotions. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Solving problems involving credit KEY: loans

**33.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 2.4

OBJ: 2.1 Identify and describe examples of assets that appreciate or depreciate. | 2.2 Compare, using examples, renting, leasing and buying. | 2.3 Justify, for a specific set of circumstances, if renting, buying or leasing would be advantageous. | 2.4 Solve a problem involving renting, leasing or buying that requires the manipulation of a formula. | 2.5 Solve, using technology, a contextual problem that involves cost-and-benefit analysis. TOP: Buy, rent, or lease?

KEY: buy | lease | loans | rent

**34.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.4

OBJ: 2.1 Identify and describe examples of assets that appreciate or depreciate. | 2.2 Compare, using examples, renting, leasing and buying. | 2.3 Justify, for a specific set of circumstances, if renting, buying or leasing would be advantageous. | 2.4 Solve a problem involving renting, leasing or buying that requires the manipulation of a formula. | 2.5 Solve, using technology, a contextual problem that involves cost-and-benefit analysis. TOP: Buy, rent, or lease?

KEY: depreciation

**35.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 2.4

OBJ: 2.1 Identify and describe examples of assets that appreciate or depreciate. | 2.2 Compare, using examples, renting, leasing and buying. | 2.3 Justify, for a specific set of circumstances, if renting, buying or leasing would be advantageous. | 2.4 Solve a problem involving renting, leasing or buying that requires the manipulation of a formula. | 2.5 Solve, using technology, a contextual problem that involves cost-and-benefit analysis. TOP: Buy, rent, or lease?

KEY: appreciation | mortgages

**36.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.4

OBJ: 2.1 Identify and describe examples of assets that appreciate or depreciate. | 2.2 Compare, using examples, renting, leasing and buying. | 2.3 Justify, for a specific set of circumstances, if renting, buying or leasing would be advantageous. | 2.4 Solve a problem involving renting, leasing or buying that requires the manipulation of a formula. | 2.5 Solve, using technology, a contextual problem that involves cost-and-benefit analysis. TOP: Buy, rent, or lease?

KEY: buy | lease | loans

**37.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 2.4

OBJ: 2.1 Identify and describe examples of assets that appreciate or depreciate. | 2.2 Compare, using examples, renting, leasing and buying. | 2.3 Justify, for a specific set of circumstances, if renting, buying or leasing would be advantageous. | 2.4 Solve a problem involving renting, leasing or buying that requires the manipulation of a formula. | 2.5 Solve, using technology, a contextual problem that involves cost-and-benefit analysis. TOP: Buy, rent, or lease?

KEY: buy | lease | loans

**38.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.4

OBJ: 2.1 Identify and describe examples of assets that appreciate or depreciate. | 2.2 Compare, using examples, renting, leasing and buying. | 2.3 Justify, for a specific set of circumstances, if renting, buying or leasing would be advantageous. | 2.4 Solve a problem involving renting, leasing or buying that requires the manipulation of a formula. | 2.5 Solve, using technology, a contextual problem that involves cost-and-benefit analysis. TOP: Buy, rent, or lease?

KEY: buy | depreciation | loans | rent

**39.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 2.4

OBJ: 2.1 Identify and describe examples of assets that appreciate or depreciate. | 2.2 Compare, using examples, renting, leasing and buying. | 2.3 Justify, for a specific set of circumstances, if renting, buying or leasing would be advantageous. | 2.4 Solve a problem involving renting, leasing or buying that requires the manipulation of a formula. | 2.5 Solve, using technology, a contextual problem that involves cost-and-benefit analysis. TOP: Buy, rent, or lease?

KEY: buy | depreciation | lease | loans

**40.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 3.1

OBJ: 2.1 Provide examples of the empty set, disjoint sets, subsets and universal sets in context, and explain the reasoning. | 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.

TOP: Types of Sets and Set Notation KEY: set | element | disjoint

**41.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 3.1

OBJ: 2.1 Provide examples of the empty set, disjoint sets, subsets and universal sets in context, and explain the reasoning. | 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.

TOP: Types of Sets and Set Notation KEY: set | element | disjoint

**42.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 3.2

OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.

TOP: Exploring Relationships between Sets KEY: set | element

**43.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 3.2

OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.

TOP: Exploring Relationships between Sets KEY: set | element

**44.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 3.2

OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.

TOP: Exploring Relationships between Sets KEY: set | element

**45.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 3.3

OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Intersection and Union of Two Sets

KEY: set | element | union

**46.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 3.3

OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Intersection and Union of Two Sets

KEY: set | element | intersection

**47.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 3.3

OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Intersection and Union of Two Sets

KEY: set | element | union | intersection

**48.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 3.3

OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Intersection and Union of Two Sets

KEY: set | element | intersection

**49.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 3.3

OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Intersection and Union of Two Sets

KEY: set | element | union

**50.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 3.4

OBJ: 2.5 Explain how set theory is used in applications such as Internet searches, database queries, data analysis, games and puzzles. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Applications of Set Theory

KEY: set | element | intersection

**51.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 3.4

OBJ: 2.5 Explain how set theory is used in applications such as Internet searches, database queries, data analysis, games and puzzles. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Applications of Set Theory

KEY: set | element | intersection

**52.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 3.4

OBJ: 2.5 Explain how set theory is used in applications such as Internet searches, database queries, data analysis, games and puzzles. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Applications of Set Theory

KEY: set | element | intersection | union

**53.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 3.4

OBJ: 2.5 Explain how set theory is used in applications such as Internet searches, database queries, data analysis, games and puzzles. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Applications of Set Theory

KEY: set | element | intersection | union

**54.** ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 3.5

OBJ: 3.1 Analyze an “if-then” statement, make a conclusion, and explain the reasoning. | 3.2 Make and justify a decision, using “what if?” questions, in contexts such as probability, finance, sports, games or puzzles, with or without technology. | 3.3 Determine the converse, inverse and contrapositive of an “if-then” statement; determine its veracity; and, if it is false, provide a counterexample. | 3.4 Demonstrate, using examples, that the veracity of any statement does not imply the veracity of its converse or inverse. | 3.6 Identify and describe contexts in which a biconditional statement can be justified. | 3.7 Analyze and summarize, using a graphic organizer such as a truth table or Venn diagram, the possible results of given logical arguments that involve biconditional, converse, inverse or contrapositive statements.

TOP: Conditional Statements and Their Converse KEY: hypothesis

**55.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 3.5

OBJ: 3.1 Analyze an “if-then” statement, make a conclusion, and explain the reasoning. | 3.2 Make and justify a decision, using “what if?” questions, in contexts such as probability, finance, sports, games or puzzles, with or without technology. | 3.3 Determine the converse, inverse and contrapositive of an “if-then” statement; determine its veracity; and, if it is false, provide a counterexample. | 3.4 Demonstrate, using examples, that the veracity of any statement does not imply the veracity of its converse or inverse. | 3.6 Identify and describe contexts in which a biconditional statement can be justified. | 3.7 Analyze and summarize, using a graphic organizer such as a truth table or Venn diagram, the possible results of given logical arguments that involve biconditional, converse, inverse or contrapositive statements.

TOP: Conditional Statements and Their Converse

KEY: converse | conditional statement | hypothesis

**56.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 3.5

OBJ: 3.1 Analyze an “if-then” statement, make a conclusion, and explain the reasoning. | 3.2 Make and justify a decision, using “what if?” questions, in contexts such as probability, finance, sports, games or puzzles, with or without technology. | 3.3 Determine the converse, inverse and contrapositive of an “if-then” statement; determine its veracity; and, if it is false, provide a counterexample. | 3.4 Demonstrate, using examples, that the veracity of any statement does not imply the veracity of its converse or inverse. | 3.6 Identify and describe contexts in which a biconditional statement can be justified. | 3.7 Analyze and summarize, using a graphic organizer such as a truth table or Venn diagram, the possible results of given logical arguments that involve biconditional, converse, inverse or contrapositive statements.

TOP: Conditional Statements and Their Converse KEY: conditional statement

**57.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 3.5

OBJ: 3.1 Analyze an “if-then” statement, make a conclusion, and explain the reasoning. | 3.2 Make and justify a decision, using “what if?” questions, in contexts such as probability, finance, sports, games or puzzles, with or without technology. | 3.3 Determine the converse, inverse and contrapositive of an “if-then” statement; determine its veracity; and, if it is false, provide a counterexample. | 3.4 Demonstrate, using examples, that the veracity of any statement does not imply the veracity of its converse or inverse. | 3.6 Identify and describe contexts in which a biconditional statement can be justified. | 3.7 Analyze and summarize, using a graphic organizer such as a truth table or Venn diagram, the possible results of given logical arguments that involve biconditional, converse, inverse or contrapositive statements.

TOP: Conditional Statements and Their Converse

KEY: conditional statement | converse

**58.** ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 3.5

OBJ: 3.1 Analyze an “if-then” statement, make a conclusion, and explain the reasoning. | 3.2 Make and justify a decision, using “what if?” questions, in contexts such as probability, finance, sports, games or puzzles, with or without technology. | 3.3 Determine the converse, inverse and contrapositive of an “if-then” statement; determine its veracity; and, if it is false, provide a counterexample. | 3.4 Demonstrate, using examples, that the veracity of any statement does not imply the veracity of its converse or inverse. | 3.6 Identify and describe contexts in which a biconditional statement can be justified. | 3.7 Analyze and summarize, using a graphic organizer such as a truth table or Venn diagram, the possible results of given logical arguments that involve biconditional, converse, inverse or contrapositive statements.

TOP: Conditional Statements and Their Converse

KEY: conditional statement | biconditional

**59.** ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 3.5

OBJ: 3.1 Analyze an “if-then” statement, make a conclusion, and explain the reasoning. | 3.2 Make and justify a decision, using “what if?” questions, in contexts such as probability, finance, sports, games or puzzles, with or without technology. | 3.3 Determine the converse, inverse and contrapositive of an “if-then” statement; determine its veracity; and, if it is false, provide a counterexample. | 3.4 Demonstrate, using examples, that the veracity of any statement does not imply the veracity of its converse or inverse. | 3.6 Identify and describe contexts in which a biconditional statement can be justified. | 3.7 Analyze and summarize, using a graphic organizer such as a truth table or Venn diagram, the possible results of given logical arguments that involve biconditional, converse, inverse or contrapositive statements.

TOP: Conditional Statements and Their Converse KEY: conditional statement

**60.** ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 3.6

OBJ: 3.3 Determine the converse, inverse and contrapositive of an “if-then” statement; determine its veracity; and, if it is false, provide a counterexample. | 3.4 Demonstrate, using examples, that the veracity of any statement does not imply the veracity of its converse or inverse. | 3.5 Demonstrate, using examples, that the veracity of any statement does not imply the veracity of its contrapositive. | 3.7 Analyze and summarize, using a graphic organizer such as a truth table or Venn diagram, the possible results of given logical arguments that involve biconditional, converse, inverse or contrapositive statements.

TOP: The Inverse and the Contrapositive of Conditional Statements

KEY: conditional statement | inverse | converse | contrapositive | hypothesis

**PROBLEM**

**1.** ANS:

**a)** *A* = *P*(1 + *rt*)

*P* is $150; *r* is 4% or 0.04; *t* is 10

*A* = 150(1 + (0.04)(10))

*A* = 210

The future value is $210.

Determine the interest earned.

210 – 150 = 60

Rate of return = 

Rate of return = 0.40

The rate of return is 40%.

**b) A.** *A* = *P*(1 + *rt*)

*P* is $150; *r* is 4% or 0.04; *t* is 10

*A* = 150(1 + (0.04)(10))

*A* = 210

The future value is $210.

**B.** *A* = *P*(1 + *rt*)

*P* is $150; *r* is 4% or 0.05; *t* is 10

*A* = 150(1 + (0.05)(10))

*A* = 225

The future value is $225.

Option B yields the greatest future value.

PTS: 1 DIF: Grade 12 REF: Lesson 1.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest.

TOP: Simple interest

KEY: simple interest | principal | future value | rate of return

**2.** ANS:

*A* = *P*(1 + *rt*)

Mai’s GIC: *P* is $1000; *r* is 1.4% or 0.014; *t* is 3

*A* = 1000(1 + (0.014)(3))

*A* = 1042

The future value of Mai’s investment is $1042.

Joan’s GIC: *P* is $1000; *r* is 1.2% or 0.012; *t* is 4

*A* = 1000(1 + (0.012)(4))

*A* = 1048

The future value of Joan’s investment is $1048.

Joan’s investment will have a greater future value on maturity even though the interest rate is lower, because the longer term made a bigger difference in the future value.

PTS: 1 DIF: Grade 12 REF: Lesson 1.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest.

TOP: Simple interest KEY: simple interest | principal | future value

**3.** ANS:

Answers may vary. e.g., I predict that option C will earn the most interest because it has the highest interest rate.

*I* = *Prt*

**A.** *P* is $400; *r* is 2% or 0.02; *t* is 2

*I* = (400)(0.02)(2)

*I* = 16

Option A will earn $16 in interest.

**B.** *P* is $500; *r* is 3% or 0.03; *t* is 2

*I* = (500)(0.03)(2)

*I* = 30

Option B will earn $30 in interest.

**C.** *P* is $400; *r* is 4% or 0.04; *t* is 2

*I* = (400)(0.04)(2)

*I* = 32

Option C will earn $32 in interest.

PTS: 1 DIF: Grade 12 REF: Lesson 1.1

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest.

TOP: Simple interest KEY: simple interest | principal | future value

**4.** ANS:

**First three years:** The principal is $65 000.

The annual interest rate is 4.2%.

The compounding period is monthly, or 12 times per year.

The term (in years) is 3.

*The future value is unknown.*

The value of the investment after three years is $73 712.12.

**Last five years:** The principal is $73 712.12.

The annual interest rate is 5.2%.

The compounding period is semi-annual, or 2 times per year.

The term (in years) is 5.

*The future value is unknown.*

The total value of the investment after eight years is $95 282.36.

PTS: 1 DIF: Grade 12 REF: Lesson 1.3

OBJ: 1.1 Explain the advantages and disadvantages of compound interest and simple interest. | 1.2 Identify situations that involve compound interest. | 1.3 Graph and compare, in a given situation, the total interest paid or earned for different compounding periods. | 1.8 Solve a contextual problem that involves compound interest.

TOP: Compound interest: future value KEY: compound interest | principal | future value

**5.** ANS:

**a)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Option A** | **Option B** | **Option C** |
| Future Value ($) | 60 000 | 60 000 | 60 000 |
| Interest Rate per Annum | 0.0615 | 0.0590 | 0.0585 |
| Periods per Year | 2 | 365 | 4 |
| Number of Years | 10 | 10 | 10 |
| Present Value ($) | 32 740.43 | 33 261.22 | 33 568.26 |
| Interest Earned | 27 259.57 | 26 738.78 | 26 431.74 |
| Rate of Return | 0.8325... | 0.8039... | 0.7874... |

Option A has the greatest rate of return at 83.26%. April should choose option A so that she earns the most interest on her investment.

**b)** April would earn $27 259.57 on her investment by choosing option A.

PTS: 1 DIF: Grade 12 REF: Lesson 1.4

OBJ: 1.2 Identify situations that involve compound interest. | 1.8 Solve a contextual problem that involves compound interest. TOP: Compound interest: present value

KEY: compound interest | future value | present value | rate of return

**6.** ANS:

**a), b)**

|  |  |  |
| --- | --- | --- |
|  | **Option i)** | **Option ii)** |
| Future Value ($) | 500 000 | 500 000 |
| Interest Rate per Annum | 0.038 | 0.0405 |
| Periods per Year | 12 | 1 |
| Number of Years | 32 | 32 |
| Regular Payment Amount ($) | 668.87 | 7902.65 |
| Principal | 256 846.08 | 252 884.80 |
| Interest Earned | 243 153.92 | 247 115.20 |
| Rate of Return | 94.67% | 97.72% |

Ed should chose option ii) because he earns more interest on less principal and has a slightly better rate of return than option i).

PTS: 1 DIF: Grade 12 REF: Lesson 1.5

OBJ: 3.2 Determine, using technology, the total value of an investment when there are regular contributions to the principal. | 3.5 Determine, using technology, possible investment strategies to achieve a financial goal. | 3.8 Solve an investment problem.

TOP: Investments involving regular payments

KEY: compound interest | principal | future value | rate of return

**7.** ANS:

**a)** Total cost = (payment amount)(number of payments per year)(number of years)

Total cost = (500)(12)(17)

Total cost = 102 000

It would cost Sasha $102 000 to rent an apartment for 17 years

**b)** The present value is $240 000 – $240 000(0.10), or $216 000.

*The regular payment amount is unknown.*

The payment frequency is 12 times a year.

The number of payments is 17(12), or 204.

The payments are made at the end of the payment periods.

The annual interest rate is 4.6%.

The compounding frequency is 2 times a year.

The future value is $0.

Using the financial application on a graphing calculator, the regular payment amount is 1523.243..., or $1523.24.

Buying cost = (payment amount)(number of payments) + down payment

Buying cost = (1523.243...)(204) + 240 000(0.10)

Buying cost = 334 741.667...

Value of house = (initial value)(appreciation rate)

Value of house = 240 000(1.015)17

Value of house = 309 124.879...

Actual cost = buying cost – equity

Actual cost = 334 741.667... – 309 124.879...

Actual cost = 25 616.788...

It will cost Sasha $25 616.79 to buy the house, taking into account equity.

**c)** Answers may vary. Sample answer: I think Sasha should buy the house if she plans to live there for several years because it is cheaper.

PTS: 1 DIF: Grade 12 REF: Lesson 2.4

OBJ: 2.1 Identify and describe examples of assets that appreciate or depreciate. | 2.2 Compare, using examples, renting, leasing and buying. | 2.3 Justify, for a specific set of circumstances, if renting, buying or leasing would be advantageous. | 2.4 Solve a problem involving renting, leasing or buying that requires the manipulation of a formula. | 2.5 Solve, using technology, a contextual problem that involves cost-and-benefit analysis. TOP: Buy, rent, or lease?

KEY: appreciation | buy | mortgages | rent

**8.** ANS:

**a)** *S* = {1, 2, 3, …, 498, 499, 500}

*S* = {*x* | 1  *x*  500, *x*  N}

*D* = {5, 10, 15, …, 490, 495, 500}

*D* = {*d* | *d* = 5*x*, 1  *x*  100, *x*  N}

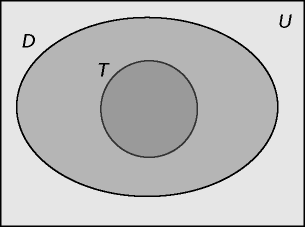
*D*  *S*

*T* = {50, 100, 150, …, 400, 450, 500}

*T* = {*t* | *t* = 5*x*, 1  *x*  10, *x*  N}

*T*  *D*  *S*

**b)**

****

PTS: 1 DIF: Grade 12 REF: Lesson 3.1

OBJ: 2.1 Provide examples of the empty set, disjoint sets, subsets and universal sets in context, and explain the reasoning. | 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.

TOP: Types of Sets and Set Notation KEY: element | set | subset

**9.** ANS:

**a)** *U* = {natural numbers from 1 to 100}

*S* = {square numbers from 1 to 100}

*O* = {odd, square numbers from 1 to 100}

*E* = {even square numbers from 1 to 100}

**i)** *S* = {1, 4, 9, 16, 25, 36, 49, 64, 81, 100}

*O* = {1, 9, 25, 49, 81}

*n*(*S*) = 10

*n*(*O*) = 5

There are 10 square numbers from 1 to 100, and 5 of these numbers are odd.

**ii)** *n*(*E*) = *n*(*S*) – *n*(*O*)

*n*(*E*) = 10 – 5

*n*(*E*) = 5

There are 5 even, square numbers from 1 to 100.

**iii)** *n*(*U*) = 100

*n*(*S*) = *n*(*U*) – *n*(*S*)

*n*(*S*) =100 – 10

*n*(*S*) = 90

There are 90 numbers from 1 to 100 that are not square numbers.

**b)** There are an infinite number of numbers, so there are an infinite number of square numbers.

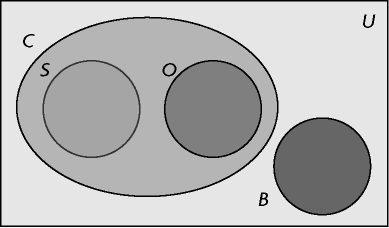
PTS: 1 DIF: Grade 12 REF: Lesson 3.1

OBJ: 2.1 Provide examples of the empty set, disjoint sets, subsets and universal sets in context, and explain the reasoning. | 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.

TOP: Types of Sets and Set Notation KEY: element | set | complement | universal set

**10.** ANS:

**a)**

****

**b)** Set *S* and set *O* are disjoint. Set *C* and set *B* are disjoint.

**c)** *C*  *U*, *B*  *U*, *S*  *C*  *U*, *O*  *C*  *U*

**d)** Set *B* is equal to set *P* because they contain the same elements.

PTS: 1 DIF: Grade 12 REF: Lesson 3.1

OBJ: 2.1 Provide examples of the empty set, disjoint sets, subsets and universal sets in context, and explain the reasoning. | 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.

TOP: Types of Sets and Set Notation KEY: element | set | universal set | disjoint

**11.** ANS:

Let *U* represent the universal set. Let *C* represent the set of people who liked cats. Let *D* represent the set of people who liked running.

*n(C*  *D*) = *n(U*) – *n(C*  *D*)

*n(C*  *D*) = 500 – 9

*n(C*  *D*) = 491

*n(C*  *D*) = *n(C*) + *n(D*) – *n(C*  *D*)

*n(C*  *D*) = 273 + 264 – 491

*n(C*  *D*) = 46

46 people like cats and dogs.

PTS: 1 DIF: Grade 12 REF: Lesson 3.3

OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.

TOP: Intersection and Union of Two Sets

KEY: set | element | union | intersection

**12.** ANS:

Let *U* represent the universal set. Let *B* represent the set of people who visited Banff National Park. Let *G* represent the set of people who visited Glacier National Park.

*n(B*  *G*) = *n(*U) – *n(B*  *G*)

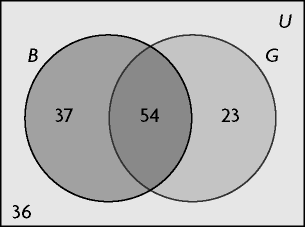
*n(B*  *G*) = 150 – 36

*n(B*  *G*) = 114

*n(B*  *G*) = *n(B*) + *n(G*)–  *n(B*  *G*)

*n(B*  *G*) = 91 + 77 – 114

*n(B*  *G*) = 54



PTS: 1 DIF: Grade 12 REF: Lesson 3.3

OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.

TOP: Intersection and Union of Two Sets

KEY: set | element | union | intersection

**13.** ANS:

Answers may vary. e.g.,

**a)** Online bookstores offer a lot of products that are not books, so the main category would be books. Second category could be Science and Nature or some other category that would include books about the universe. The subcategory of Science and Nature she would want could be Science or maybe Technology or Nature. Other search categories could include age range, format (ebook, paperback, hardcover, etc.), price, and so on.

**b)** Let *U* = {All books}

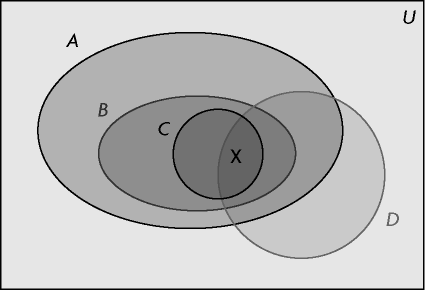
*A* = {Science and Nature books}

*B* = {Science books}

*C* = {astronomy books}

*D* = {books for 9-12 year olds}

X = region showing search results



PTS: 1 DIF: Grade 12 REF: Lesson 3.4

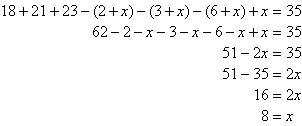
OBJ: 2.5 Explain how set theory is used in applications such as Internet searches, database queries, data analysis, games and puzzles. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Applications of Set Theory

KEY: set | element | union | intersection

**14.** ANS:

Let *x* represent the number of tourists who went to all three attractions.

Using the principle of inclusion and exclusion for three sets:



8 tourists went to all three attractions.

PTS: 1 DIF: Grade 12 REF: Lesson 3.4

OBJ: 2.5 Explain how set theory is used in applications such as Internet searches, database queries, data analysis, games and puzzles. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Applications of Set Theory

KEY: set | element | union | intersection