Foundations for College Mathematics, Grade 11, College Preparation, Grade 11 (MBF3C)

Mathematical Models

A1: Investigating Graphs and Equations of Quadratic Relations			
McGraw-Hill, Mathematics Applying the Concepts, Grade 10 Applied		***Addison Wesley, Foundations of Mathematics, Grade 10 Applied***	
Chapter 8: Quadratic Functions		*Chapter 7: From Algebra to Quadratic Equations*	
8.1: Introduce Quadratic Functions	A1.1, A1.2	7.2: Common Factoring	A1.7
8.2: Quadratic Functions of the Form $y = ax^2$	A1.1-A1.4	7.4: Multiplying Two Binomials	A1.5
8.3: Quadratic Functions of the Form $y = x^2 + k$	A1.3, A1.4	7.5: Expanding and Simplifying Polynomial Expressions	A1.5
8.4: Quadratic Functions of the Form $y = (x-h)^2$	A1.3, A1.4	7.6: Factoring Trinomials of the Form $x^2 + bx + c$	A1.7
8.5: Quadratic Functions of the Form $y = a(x-h)^2 + k$	A1.3, A1.4	7.7: Factoring a Difference of Squares	A1.7
		7.8: Solving Quadratic Equations by Factoring	A1.9
Chapter 9: Algebraic Expressions		*Chapter 8: Analysing Quadratic Functions*	
9.1: Multiply Two Binomials	A1.5	8.1: Transforming the Graph of $y = x^2$	A1.3, A1.4
9.2: Special Products	A1.5	8.2: Analysing the Graph of $y = a(x - p)^2 + q$	A1.3, A1.4
9.4: Common Factors	A1.7	8.3: Relating the Graphs of $y = ax^2 + bx + c$ and $y = a(x - p)^2 + q$	A1.8, A1.6
9.5: Factors of a Difference of Squares	A1.7	8.4: Applications of Quadratic Functions	A1.1, A.1.2
9.6: Factors of Trinomials of the Form $x^2 + bx + c$	A1.7	8.5: Mathematical Modelling*:* The Basketball Free Throw	A1.1, A1.2
9.7: Solve Quadratic Equations by Factoring	A1.9		
Chapter 10: Solve Problems: Quadratic Functions			
10.1: Relate Roots and Intercepts	A1.8, A1.9		
10.2: Standard and General Forms of A Quadratic Functions	A1.6, A1.9		

A2: Understanding Exponential Growth and Decay A3: Investigation of Graphs and Equations of Exponential Relations			
McGraw Hill, Making Financial Decisions 11		***Addison Wesley, Mathematics of Personal Finance 11***	
Chapter 2: Exponential Expressions		*Chapter 3: Exponential Growth*	
2.1: Evaluate Powers with Integral Exponents	A3.1-A3.3	Necessary Skills **The expectations state "determine through investigation" which is not the approach in this section.**	A3.1-A3.3
2.2: Powers with Rational Exponents	A3.1-A3.3	3.1: Introduction to Exponential Functions	B1.1 A3.5
2.3: Evaluate Exponential Expressions Using a Scientific Calculator	A3.1-A3.3	3.2: Rational Exponents	A3.5
2.4: Solve Exponential Equations Using Common Bases	A3.1-A3.3	3.3: Properties of Exponential Functions	A3.4, A3.5
		3.4: Exponential Growth	A2.1, A2.3, A3.6
		3.5: Exponential Decay	A2.1, A2.3, A3.6
Chapter 6: Exponential Growth		**The following expectations are not completely covered by the Addison Wesley textbook**	
6.1: Exponential Functions	A2.1, A3.4 A3.5	A2.2 distinguish exponential growth from linear and quadratic growth by making comparisons in a variety of ways (e.g., comparing rates of change using finite differences in tables of values; inspecting graphs; comparing equations)	A2.2
6.2: Sketch Graphs of Exponential Functions	A2.1, A3.4, A3.5	A2.3. pose and solve problems based on applications involving an exponential relation (e.g. population growth, radioactive decay, compound interest) by using a given graph or a graph generated with technology from its equation.	A2.3
6.3: Compare Rates of Change	A2.2		
6.4: Applications of Exponential Functions	A2.3, A3.6		

Personal Finance

B1: Solving Problems Involving Compound Interest			
McGraw Hill, Making Financial Decisions 11		**Addison Wesley, Mathematics of Personal Finance 11**	
Chapter 1:Personal Financial Planning		*Chapter 1: Linear Growth*	
1.4: Simple Interest	B1.2, B1.4	1.5: Simple Interest	B1.2
		1.6: Simple Interest: Determining P, r, t	B1.2
Chapter 3: Sequences and Simple and Compound Interest		*Chapter 2: Compound Interest*	
3.4: Compound Interest	B1.1-B1.5	2.1: Compound Interest	B1.2-B1.5
3.5: Present Value	B1.3	2.2: The Amount of an Investment	
3.6: Linear and Exponential Growth	B1.2	2.3: Compounding Periods Less than One Year	
		2.4: Present Value	
		2.5: Compound Interest: Determine i and n.	
		2.6: Project: Canada Savings Bonds	B2.2
		Chapter 7: Planning for the Future	
		7.7: Project: Investment Options	B2.2
		The following expectations are not completely covered by the Addison Wesley textbook	
		B1.1 determine, through investigation (e.g., using spreadsheets and graphs), and describe the relationship between compound interest and exponential growth	B1.1
		B1.2 compare, using a table of values and graphs, the simple and compound interest earned for a given principal (i.e., investment) and a fixed interest rate over time	B1.2

B2: Investing and Borrowing			
McGraw Hill, Making Financial Decisions 11		**Addison Wesley, Mathematics of Personal Finance 11**	
Chapter 4: The Effects of Compounding		*Chapter 5: Annuities: The Cost of Credit*	
4.1: Effect of Interest Rates	B2.3	5.7: Project: Debit and Credit	2.4, 2.6
4.2: Effect of Compounding Frequency			
4.3: Find the Interest Rate			
4.4: Find the Term	B2.3, B2.1		
4.5: Savings and Investment Alternatives	B2.1, B2.2		
Chapter 8: Consumer Spending		**The following expectations are not completely covered by the Addison Wesley textbook**	
8.1: Manage Your Retail Dollar	B2.1, B2.4, B2.5 B2.6	B2.1 determine, through investigation, and compare information about the various savings alternatives commonly available from financial institutions (e.g., savings and chequing accounts, term investments), the related costs (e.g., cost of cheques, monthly statement fees, early withdrawal penalties), and possible ways of reducing the costs (e.g., maintaining a minimum balance in a savings account; paying a monthly flat fee for a package of services);	B2.1
8.2: Manage Debit and Credit Cards	B2.4 B2.5 B2.6	B2.3 determine, using technology, the effect on savings of changing the variables involved in compound interest (e.g., the effect of different compounding periods on the growth of the same investment)	B2.3
		B2.5 solve problems involving applications of the compound interest formula in determining the cost of borrowing when making a purchase on credit	B2.5

B3: Owning and Operating a Vehicle			
McGraw Hill, Making Financial Decisions 11		*Addison Wesley, Mathematics of Personal Finance 11*	
Chapter 7: Vehicle Costs		*Chapter 7: Planning for the Future*	
7.1: Investigate Buying a New Vehicle	B3.1, B3.2, B3.3	7.1: Buying a Vehicle	B3.1
7.2: Compare Buying a New Versus a Used Vehicle		7.2: Leasing A Vehicle	B3.1
7.3: Fixed and Variable Operating Costs		7.3: Costs of Operating a Vehicle	B3.3
7.4: Buying Versus Leasing		7.4: Investigating the Choice of a Vehicle	B3.1
		The following expectations are not completely covered by the Addison Wesley textbook	
		B3.2 gather and describe information concerning the procedures and costs involved in insuring a vehicle and the factors affecting insurance rates (e.g., gender, age, driving record, model of vehicle, use of vehicle), and compare the insurance costs for different categories of drivers and for different vehicles	B3.2

Geometry and Trigonometry

C1: Representing Two – Dimensional Shapes and Three – Dimensional Figures			
McGraw Hill, Mathematics 12: Preparing for College & Apprenticeship		***Addison Wesley, College and Apprenticeship Mathematics 12***	
Chapter 2: Problem Solving with Measurement		*Chapter 3: Measurement in Design*	
2.1: Systems of Measure	C1.3	3.1: Imperial Measurement	C1.3
2.2: Converting between Metric and Imperial	C1.3	3.6: Problem Solving: Combining Objects	C1.4
		3.7: Project: Landscaping	C1.4
Chapter 3:Geometry in Design		*Chapter 4: Geometry in Design*	
3.1: Geometric Shapes in Design	C1.1	4.1: Tiling	C1.1
3.2: Representing Three - Dimensional Objects	C1.2, C1.3	4.2: Symmetry in Patterns and Designs	C1.1
3.3: Creating Nets, Plans, and Patterns	C1.3	4.3: Representing Objects: Using Perspective and Views	C1.2
3.4: Designing and Constructing Physical Models	C1.4	4.4: Representing Objects: Using Scale Drawings	C1.2
		4.5: Creating Nets and Patterns from Physical Objects	C1.3
		4.6: Plans and Models	C1.3
		4.8: Designing and Constructing a Model	C1.4
C2: Applying the Sine Law and the Cosine Law in Acute Triangles			
McGraw Hill, Mathematics 12: Preparing for College & Apprenticeship		***Addison Wesley, College and Apprenticeship Mathematics 12***	
Chapter 1: Trigonometry		*Chapter 1: Trigonometry*	
1.1: Using Trigonometry to Find Lengths	C2.1	1.1: Determining Lengths of Sides in Right Triangles	C2.1
1.2: Using Trigonometry to Find Angles	C2.1	1.2: Determining the Measures of Angles in Right Triangles	C2.1
1.4: The Sine Law	C2.2, C2.3	1.3: The Sine Law in Acute Triangles **(expectation requires investigation using technology)**	C2.2
1.5: The Cosine Law	C2.2, C2.3	1.5: The Cosine Law **(expectation requires investigation using technology)**	C2.2
1.6: Problem Solving with Non-Right Triangles (all metric)	C2.4	1.6: Solving Triangles	C2.3
		1.7: Selecting a Strategy	C2.4

Data Management

D1: Working with One-Variable Data			
McGraw Hill, Mathematics 12: Preparing for College & Apprenticeship		***Addison Wesley, College and Apprenticeship Mathematics 12***	
Chapter 4: Single-Variable Statistics		*Chapter 5: Sampling*	
4.1: Collecting Data: Sampling Techniques	D1.1, D1.3, D1.4 D1.10	5.1: Gathering Data	D1.1
4.2: Methods of Collecting Data	D1.2 D1.10	5.2: Selecting a Sample	D1.3, D1.4
4.3: Representing Data	D1.5 D1.10	5.3: Survey Design	D1.3
4.4: Measures of Central Tendency	D1.7, D1.8 D1.10	5.4: Using Technology to Graph Data	D1.5
4.5: Properties of Common Distributions	D1.8, D1.9 D1.10	5.5: Assessing Reported Survey Results	D1.10
4.6: Properties of Common Distributions	D1.6 D1.10	5.6: Project: Collecting Data	D1.2
		Chapter 6: Data Analysis	
		6.1: Measures of Central Tendency and Spread	D1.7, D1.9
		6.2: Distributions of Data	D1.6
		6.3: The Normal Distribution	D1.6
		The following expectations are not completely covered by the Addison Wesley textbook	
		D1.8. calculate, using formulas and/or technology (e.g., dynamic statistical software, spreadsheet, graphing calculator), and interpret measures of central tendency (i.e., mean, median, mode) and measures of spread (i.e., range, standard deviation);	D1.8

D2. Applying Probability			
McGraw Hill, MATHPOWER Nine		***Addison Wesley, Minds on Math***	
Chapter 10: Statistics and Probability		*Chapter 2: Statistics and Probability*	
10.9: Possible Outcomes	D2.2	Pgs 90 – 94 : Making Predictions (could extend to include 2.4 and 2.5)	D2.3
10.10: The Probability Formula	D2.2, D2.4	Pgs 95 – 98 : Probability (could extend to include 2.4 and 2.5)	D2.2
10.11: Independent Events	D2.3, D2.5	Pgs 82-85: Math and Media, Sampling and TV Ratings	D2.6
10.12: Dependent Events	D2.3, D2.4		
LEARING TOGETHER: Experimental Probability	D2.3, D2.4	Pgs 99 – 108 are interesting and could be added although they are not directly linked to the expectations.	
The following expectations are not adequately covered by the McGraw Hill MATHPOWER 9 textbook		**The following expectations are not adequately covered by the Addison Wesley, Minds on Math textbook**	
D2.1 identify examples of the use of probabilities in the media and various ways in which probability is represented (e.g., as a fraction, as a percent, as a decimal in the range 0 to 1);	D2.1	D2.1 identify examples of the use of probabilities in the media and various ways in which probability is represented (e.g., as a fraction, as a percent, as a decimal in the range 0 to 1);	D2.1
D2.6. interpret information involving the use of probability and statistics in the media, and make connections between probability and statistics (e.g., both probabilities and statistics can be used to make predictions).	D2.6	D2.4. compare, through investigation, the theoretical probability of an event with the experimental probability, and explain why they might differ	D2.4
		D2.5. determine, through investigation, the tendency of experimental probability to approach theoretical probability as the number of trials in an experiment increases (e.g., “if I simulate tossing a coin 1000 times using technology, the experimental probability that I calculate for tossing tails is likely to be closer to the theoretical probability than if I only simulate tossing the coin 10 times”), using class-generated data and technology-based simulation models (e.g., using a random-number generator on a spreadsheet or on a graphing calculator);	D2.5