UBC PMBA Academic Preparation

Suggested free online resources

Where to begin: Please review each section and complete those areas with which you are not currently comfortable. Most tutorials include quizzes and practice tests, so completing these is a good way to quickly review if you are comfortable with the content.

If you would like to track your learning progress you can sign up for a user account with Khan Academy, but this is not required.

Completion times: We have estimated the times to complete each section based on the length of videos and allocating time for the practice questions. It may take you a longer or shorter time than we have indicated, and after a few sections you will begin to get an idea of your speed compared to our estimates.

Disclaimer: These tutorials have not been vetted in-depth. They have been selected based on the concepts included and tutorial descriptions. Students are encouraged to explore the content and cover concepts with which they are unfamiliar. The aim is to ensure that you have foundational proficiency in these topics, but not all concepts may apply directly to course work.

All resources below are from Khan Academy, unless otherwise indicated.

If you have feedback about these academic prep materials, please send it to askpmba@sauder.ubc.ca.

QUANTITATIVE METHODS

Arithmetic (2 hours approximate study time)

(Statistics, Operations, Finance, and Economics)

The Basic Order of Operations (PEMDAS)

- Order of Operations (20 mins)

Fractions (approx. 1 hour 15 mins total)

- Introduction to Fractions (15 mins)
- Equivalent Fractions (40 mins)
- Simplifying Tricky Fractions (20 mins)

Averages

- Averages (9 mins)

Linear Equations & Functions

- Modeling with Linear Equations (10 mins)

Excel (30 mins to 2 hours approximate study time)

(Statistics, Operations, Finance)

- Excel training (delivered by Microsoft)
  Please skip any sections you are familiar with

Algebra (19 hours approximate study time)

Functions (approx. 1 hour 20 mins total) (Economics)

- Maximum and minimum points (15 mins)
- Average rate of change (30 mins)
- Average rate of change word problems (35 mins)

Logarithms (approx. 45 mins total) (Economics & Finance)

- Introduction to Logarithms (45 mins)

Introduction to Algebra (approx. 3 hours 50 mins total) (Statistics/Operations)

- Overview and history of algebra (35 mins)
- Introduction to variables (25 mins)
- Substitution and evaluating expressions (15 mins)
- Evaluating expressions word problems (15 mins)
- Writing algebraic expressions introduction (23 mins)
- Dependent & independent variables (10 mins)
- Combining like terms (32 mins)
- Introduction to equivalent algebraic expressions (7 mins)
- Interpreting linear expressions (10 mins)
- Division by zero (15 mins)
- Practice test (25 mins)

One-variable Linear Equations (approx. 5 hours total) (Statistics/Operations)

- Algebraic equations basics (23 mins)
- Why we do the same thing to both sides of an equation (15 mins)
- One-step addition & subtraction equations (25 mins)
- One-step multiplication & division equations (40 mins)
- Two-steps equations intro (20 mins)
- Two-step equation word problems (20 mins)
- Linear equations with variables on both sides (35 mins)
- Linear equations with parentheses (20 mins)
- Analyzing the number of solutions to linear equations (18 mins)
- Linear equations word problems (25 mins)
- Linear equations with unknown coefficients (10 mins)
- Practice test (25 mins)

One-variable Linear Inequalities (approx. 1 hour 10 mins total) (Statistics/Operations)

- Introduction to inequalities with variables (40 mins)
- One-step inequalities (20 mins)
- Quiz (10 mins)

Two-variable Linear Equations **(approx. 6 hours 50 mins)** **(Statistics/Operations)**

- Two-variable linear equations intro (30 mins)
- x-intercepts and y-intercepts (40 mins)
- Slope (50 mins)
- Horizontal & vertical lines (20 mins)
- Intro to slope-intercept form (30 mins)
- Graphing slope-intercept equations (25 mins)
- Writing slope-intercept equations (50 mins)
- Point-slope form (30 mins)
- Standard form (35 mins)
- Summary: Forms of two-variable linear equations (35 mins)
- Practice test (30 mins)

Finance & Capital Markets (2 hours 20 mins approximate study time)

Ratio, Proportion and Percent

- Introduction to Ratios (30 mins)
- Percent Word Problems (10 mins)

Accounting & Financial Statements

- Cash versus accrual accounting (13 mins)
- Three core financial statements (27 mins)

Interest & Debt

- Compound interest basics (17 mins)
- Present value (45 mins)

Statistics (11 hours 40 mins approximate study time)

(Statistics/Operations)

Displaying & Describing Data **(approx. 6 hours 50 mins total)** (only sections indicated below)

- About (1 min)
- Statistics overview (20 mins)
- Categorical data displays (20 mins)
- Two-way tables for categorical data (35 mins)
- Histograms (15 mins)
- Line graphs (6 mins)
- Mean and median: The basics (45 mins)
- Range, Interquartile range (IQR) - just Range & IQR (no MAD) (15 mins)
    - Range and mid-range
    - Interquartile range (IQR)
    - Practice
    - Comparing range and interquartile range (IQR)

    - Interquartile range review
- Population variance and standard deviation (1 hour 15 mins)
- Sample variance and standard deviation (1 hour 45 mins)
- Practice test (30 mins)

Modelling Data Distribution (approx. 2 hours 40 mins total)

- About (1 min)
- Describing location in a distribution (28 mins)
- Normal distributions (2 hours 10 mins)

Probability (approx. 1 hour 25 mins total) (only sections below)

- Basic theoretical probability (50 mins)
- Probability using sample spaces (20 mins)
- Quiz #1 (15 mins)

Probability Distributions

- Constructing a Probability Distribution (7 mins)

Sampling Distributions (approx. 35 mins total) (only sections below)

- Sampling distribution of the sample proportion (11 mins)
- Sampling distribution of the sample mean 2 (14 mins)

Differential Calculus (16 hours approximate study time)

(Economics)

Derivative introduction (approx. 4 hours 40 mins total)

- Introduction to differential calculus (35 mins)
- Derivative as slope of tangent line (15 mins)
- Derivative as instantaneous rate of change (20 mins)
- Secant lines (45 mins)
- Derivative as a limit (25 mins)
- Formal definition of derivative (20 mins)
- Using the formal definition of derivative (50 mins)
- Differentiability (27 mins)
- Derivative as a function (25 mins)
- Review: Derivative basics (15 mins)

Basic differentiation (approx. 3 hours 20 mins total)

- Basic differentiation rules (40 mins)
- Power rule (23 mins)
- Polynomial functions differentiation (45 mins)
- Rational functions differentiation (intro) (20 mins)
- Radical functions differentiation (intro) (20 mins)
- Sine & cosine derivatives (15 mins)

- e^x and ln(x) derivatives (5 mins)
- Review: Basic differentiation (30 mins)

Product, quotient & chain rules (approx. 3 hours total)

- Product rule (45 mins)
- Chain rule (50 mins)
- Chain rule proof (25 mins)
- Quotient rule (40 mins)
- Review: Product, quotient, & chain rule (15 mins)

Differentiating common functions (approx. 2 hours 50 mins total)

- Rational functions differentiation (18 mins)
- Radical functions differentiation (10 mins)
- Trigonometric functions differentiation (35 mins)
- Exponential functions differentiation (30 mins)
- Logarithmic functions differentiation (35 mins)
- Derivatives capstone (40 mins)

Derivative applications (approx. 1 hour 40 mins total)

- Optimization (1 hour 40 mins)