

**NATIONAL BUSINESS EDUCATION STANDARDS
CROSS-REFERENCED WITH PENNSYLVANIA
ACADEMIC STANDARDS**

Pennsylvania *Mathematics* Standards

National Business Education *Accounting* Standards

I. Accounting Cycle: Complete and explain the purpose of the various steps of accounting cycle.

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

II. Accounting Process: Apply generally accepted accounting principles to determine the value of assets, liabilities, and owner's equity.

A. Assets

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.

- 2.2.11 D Describe and explain the amount of error that may exist in a computation using estimates.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
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- 2.8.11 T Analyze and categorize functions by their characteristics.

B. Liabilities

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
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- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.

2.8.11 T Analyze and categorize functions by their characteristics.

C. Owner's Equity

2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.

2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.

2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.

2.4.11 B Construct valid arguments from stated facts.

2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.

2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.

2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.

2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.

2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.

2.8.11 T Analyze and categorize functions by their characteristics.

III. Financial Statements: Prepare, interpret and analyze financial statements using manual and computerized systems for service, merchandising and manufacturing businesses.

A. Financial Statement Preparation and Analysis

2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.

2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.

2.4.11 E Demonstrate mathematical solutions to problems.

2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.

2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.

- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 Q Represent functional relationships in tables, charts and graphs.
- 2.8.11 R Create and interpret functional models.
- 2.8.11 T Analyze and categorize functions by their characteristics.
- 2.11.11 C Graph and interpret rates of growth/decay.

B. Income Statements for the Three Types of Business Operations

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 E Demonstrate mathematical solutions to problems.

IV. Special Applications: Apply appropriate accounting principals to payroll, income taxation, managerial systems, and various forms of ownership.

A. Forms of Ownership

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 E Demonstrate mathematical solutions to problems.

B. Payroll

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.

- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.

C. Income Taxation

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 E Demonstrate mathematical solutions to problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.

D. Managerial Accounting Principles and Systems

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 D Describe and explain the amount of error that may exist in a computation using estimates.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 E Demonstrate mathematical solutions to problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.

V. Interpretation and Use of Data: Use planning and control principles to evaluate the performance of an organization and apply differential analysis and present-value concepts to make decisions.

A. Planning and Control

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 D Describe and explain the amount of error that may exist in a computation using estimates.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.

- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
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- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.

B. Decision Making

- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 D Describe and explain the amount of error that may exist in a computation using estimates.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.

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Pennsylvania *Mathematics* Standards

National Business Education *Business Law* Standards

I. Basics of the Law: Analyze the relationship between ethics and the law and describe sources of the law, the structure of the court system, different classifications of procedural law, and different classifications of substantive law.

A. Ethics and the Law

2.4.11 B Construct valid arguments from stated facts.

2.4.11 C Determine the validity of an argument.

B. Sources of the Law

C. Structure of the Courts

2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.

D. Classification of Procedural Law

E. Classification of Substantive Law

2.4.11 B Construct valid arguments from stated facts.

2.4.11 C Determine the validity of an argument.

II. Contract Law, Law of Sales, and Consumer Law: Analyze the relationships between contract law, law of sales, and consumer law.

A. Contract Law

B. Law of Sales

C. Consumer Law

- III. **Agency and Employment:** Analyze the role and importance of agency law and employment law as they relate to the conduct of business in the national and international marketplaces.
 - A. Agency
 - B. Employment

- IV. **Business Organizations:** Describe the major types of business organizations operating within the socioeconomic arena of the national and international marketplace.
 - A. Sole Proprietorships and Partnerships
 - B. Corporations
 - C. Limited Liability Companies

- V. **Property Law:** Explain the legal rules that apply to personal property and real property.
 - A. Personal Property
 - B. Real Property

- VI. **Commercial Paper, Insurance, Secured Transactions, Bankruptcy:** Analyze the functions of commercial paper, insurance, secured transactions, and bankruptcy.
 - A. Commercial Paper
 - B. Insurance
 - 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
 - C. Secured Transactions
 - D. Bankruptcy

- VII. **Computer Law:** Explain how advances in computer technology impact such areas as property law, contract law, criminal law, and international law.
 - A. Basics of Computer Law
 - B. Ownership Issues

- C. **Contract Issues**
- D. **Criminal Law and Privacy Issues**
- E. **E-Commerce**
- F. **International Issues**

VIII. Environmental Law and Energy Regulation: Explain the legal rules that apply to the environment and energy regulation.

A. Environmental Law

2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.

B. Energy Regulation

IX. Domestic Relations Law: Explain the legal rules that apply to marriage, divorce, and child custody.

A. Marriage and its Legal Consequences

2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.

B. Divorce and its Legal Consequences

X. Wills and Trusts: Determine the appropriateness of wills and trusts in estate planning.

A. Wills

B. Trusts

**NATIONAL BUSINESS EDUCATION STANDARDS
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Pennsylvania *Mathematics* Standards

National Business Education *Career Development* Standards

- I. Self-Awareness: Assess personal skills, abilities, and aptitudes and personal strengths and weaknesses as they relate to career exploration and development.**
 - A. Personal Skills, Abilities, and Aptitudes**
 - B. Personal Strengths and Weaknesses**

- II. Career Research: Utilize career resources to develop a career information database that includes international career opportunities.**
 - A. Career Resources and Related Information**
 - 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
 - 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
 - 2.11.11 C Graph and interpret rates of growth/decay.
 - B. International Career Opportunities**

- III. Workplace Expectations: Relate the importance of workplace expectations to career development.**
 - A. Work Ethic**
 - B. Workplace Relationships**
 - C. Workplace Diversity**
 - 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
 - D. Workplace Communication Skills**
 - E. Continual Skills Improvement**
 - F. Virtual Work Environment**

G. Career and Job Self-Management

2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.

IV. Career Strategy: Apply knowledge gained from individual assessment to a comprehensive set of goals and an individual career plan.

A. Self-Assessment and Career Research

2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.

2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.

2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.

B. Short- and Long-Term Career Goals

2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.

2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.

C. Individual Career Plan

2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.

V. School-to-Career Transition: Develop strategies to make an effective transition from school to career.

A. Workplace Experiences

B. Career Development File and Employment Portfolio

C. Job Search Strategies

2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.

VI. Lifelong Learning: Relate the importance of lifelong learning to career success.

A. Personal Growth

B. Career Growth

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Pennsylvania *Mathematics* Standards

National Business Education *Communication* Standards

- I. **Foundations of Communication:** Communicate in a clear, courteous, concise, and correct manner on personal and professional levels.
 - A. Oral Communication
 - B. Informational Reading
 - C. Written Communication
 - D. Social and Business Listening

- II. **Social Communication:** Apply basic social communication skills in personal and professional situations.
 - A. Positive Self-Concept and Image.
 - B. Human Relations and Interpersonal Skills

- III. **Technological Communication:** Use technology to enhance the effectiveness of communication.
 - 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.

- IV. **Employment Communication:** Integrate all forms of communication in the successful pursuit of employment.

- V. **Organizational Communication:** Incorporate appropriate leadership and supervision techniques, customer service strategies, and personal ethics standards to communicate effectively with various business constituencies.
 - A. Customer Relations
 - B. Business Relationships
 - C. Leadership

D. Supervisory Communication

E. Personal Ethics

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Pennsylvania *Mathematics* Standards

National Business Education *Computation* Standards

(Standards I, II and III do not have level 3 standards since these standards are achieved at an earlier level.)

- I. **Mathematical Foundations:** Apply basic mathematical operations to solve problems.
- II. **Number Relationships and Operations:** Solve problems involving whole numbers, decimals, fractions, percents, ratios, averages, and proportions.
- III. **Patterns, Functions, and Algebra:** Use algebraic operations to solve problems.
- IV. **Measurements:** Use common international standards of measurement when solving problems.

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- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
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- 2.8.11 T Analyze and categorize functions by their characteristics.

V. **Statistics and Probability: Analyze and interpret data using common statistical procedures.**

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- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 A Describe the data as an example of a distribution using statistical measures of center and spread. Organize and represent the results with graphs.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using estimation and using technology to verify them.
- 2.6.11 E Determine the validity of the sampling method described in a given study.
- 2.6.11 H Use sampling techniques to draw inferences about large populations.
- 2.7.11 A Compare odds and probability.
- 2.7.11 B Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.
- 2.7.11 C Draw and justify a conclusion regarding the validity of a probability or statistical argument.
- 2.7.11 D Use experimental and theoretical probability distributions to make judgments about the likelihood of various outcomes in uncertain situations.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

VI. Problem-Solving Applications: Use mathematical procedures to analyze and solve business problems.

A. Taxation

- 2.1.11 A Use operations.
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- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

B. Savings and Investments

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.

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- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
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- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
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- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

C. Payroll and Human Resource Management

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
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- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.

- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

D. Cash Management

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
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- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

E. Financial Management

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
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F. Credit Management

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
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- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.

- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
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G. Purchases

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
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- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

H. Sales

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.

- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 E Demonstrate mathematical solutions to problems.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

I. Inventory Records

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 E Demonstrate mathematical solutions to problems.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
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- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.

- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

J. Depreciation, Cost Recovery, and Depletion

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 E Demonstrate mathematical solutions to problems.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

K. Computers, Information Technology, and the Internet

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 E Demonstrate mathematical solutions to problems.

- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

L. Manufacturing and Office Costs

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 E Demonstrate mathematical solutions to problems.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.

- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics.

M. Insurance

- 2.1.11 A Use operations.
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 E Demonstrate mathematical solutions to problems.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 T Analyze and categorize functions by their characteristics

**NATIONAL BUSINESS EDUCATION STANDARDS
CROSS-REFERENCED WITH PENNSYLVANIA
ACADEMIC STANDARDS**

Pennsylvania *Mathematics* Standards

National Business Education *Economics* Standards

I. Allocation of Resources: Assess opportunity costs and trade-offs involved in making choices about how to use scarce economic resources.

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 C Construct and apply mathematical models, including lines and curves of best fit, to estimate values of related quantities.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 C Determine the validity of an argument.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.7.11 B Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.
- 2.7.11 C Draw and justify a conclusion regarding the validity of a probability or statistical argument.
- 2.7.11 E Solve problems involving independent simple and compound events.
- 2.8.11 B Give examples of patterns that occur in data from other disciplines.
- 2.8.11 C Use patterns, sequences and series to solve routine and non-routine problems.

II. Economic Systems: Explain why societies develop economic systems, identify the basic features of different economic systems, and analyze the major features of the U.S. economic system.

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which and exact answer is not needed.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 C Determine the validity of an argument.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.7.11 B Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.
- 2.7.11 C Draw and justify a conclusion regarding the validity of a probability or statistical argument.
- 2.7.11 E Solve problems involving independent simple and compound events.
- 2.8.11 B Give examples of patterns that occur in data from other disciplines.
- 2.8.11 C Use patterns, sequences and series to solve routine and non-routine problems.

III. Economic Institutions and Incentives: Analyze the role of core economic institutions and incentives in the U.S. economy.

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which and exact answer is not needed.
- 2.2.11 D Describe and explain the amount of error that may exist in a computation using estimation.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.7.11 C Draw and justify a conclusion regarding the validity of a probability or statistical argument.
- 2.7.11 D Use experimental and theoretical probability distributions to make judgments about the likelihood of various outcomes in uncertain situations.
- 2.8.11 B Give examples of patterns that occur in data from other disciplines.

IV. Markets and Prices: Analyze the role or markets and prices in the U.S. economy.

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 C Construct and apply mathematical models, including lines and curves of best fit, to estimate values of related quantities.
- 2.2.11 D Describe and explain the amount of error that may exist in a computation using estimation.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 A Use direct proofs, indirect proofs, or proof by contradiction to validate conjectures.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 C Determine the validity of an argument.
- 2.4.11 E Demonstrate mathematical solutions to problems (e.g., in the physical sciences).
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.6.11 H Use sampling techniques to draw inference about large populations.
- 2.7.11 B Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.
- 2.7.11 D Use experimental and theoretical probability distributions to make judgments about the likelihood of various outcomes in uncertain situations.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.
- 2.8.11 B Give examples of patterns that occur in data from other disciplines.

- 2.8.11 C Use patterns, sequences and series to solve routine and non-routine problems.
- 2.8.11 D Formulate expressions, equations, inequalities, systems of equations, systems of inequalities, and matrices to model routine and non-routine problem situations.
- 2.8.11 E Use equations to represent curves (e.g., lines, circles, ellipses, parabolas, hyperbolas).
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.
- 2.8.11 K Select, justify, and apply an appropriate technique to graph a linear function in two variables, including slope-intercept, x- and y- intercepts, graphing by transformations and the use of a graphing calculator.
- 2.8.11 L Write the equation of a line when given the graph of the line, two points on the line, or the slope of the line and a point on the line.
- 2.8.11 N Solve linear, quadratic and exponential equations both symbolically and graphically.
- 2.8.11 O Determine the domain and range of a relation, given a graph or set of ordered pairs.
- 2.8.11 P Analyze a relation to determine whether a direct or inverse variation exists and represent it algebraically and graphically.
- 2.8.11 Q Represent functional relationships in tables, charts and graphs.
- 2.11.11 A Determine the maximum and minimum values of a function over a specified interval.
- 2.11.11 B Interpret maximum and minimum values in problem situations.

V. **Market Structures: Analyze the different types of market structures and the effect they have on the price and the quality of the foods and services produced.**

VI. **Productivity: Explain the importance of productivity and analyze how specialization, division of labor, investment in physical and human capital, and technological change affect productivity.**

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which and exact answer is not needed.
- 2.2.11 C Construct and apply mathematical models, including lines and curves of best fit, to estimate values of related quantities.
- 2.4.11 A Use direct proofs, indirect proofs, or proof by contradiction to validate conjectures.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 C Determine the validity of an argument.

- 2.4.11 E Demonstrate mathematical solutions to problems (e.g., in the physical sciences).
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.6.11 E Determine the validity of the sampling method described in a given study.
- 2.6.11 G Describe questions of experimental design, control groups, treatment groups, cluster sampling and reliability.
- 2.6.11 H Use sampling techniques to draw inferences about large populations.
- 2.7.11 B Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.
- 2.7.11 C Draw and justify a conclusion regarding the validity of a probability or statistical argument.
- 2.7.11 D Use experimental and theoretical probability distributions to make judgments about the likelihood of various outcomes in uncertain situations.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.
- 2.8.11 B Give examples of patterns that occur in data from other disciplines.
- 2.8.11 C Use patterns, sequences and series to solve routine and non-routine problems.
- 2.8.11 K Select, justify, and apply an appropriate technique to graph a linear function in two variables, including slope-intercept, x- and y- intercepts, graphing by transformations and the use of a graphing calculator.
- 2.8.11 L Write the equation of a line when given the graph of the line, two points on the line, or the slope of the line and a point on the line.
- 2.8.11 N Solve linear, quadratic and exponential equations both symbolically and graphically.
- 2.8.11 P Analyze a relation to determine whether a direct or inverse variation exists and represent it algebraically and graphically.
- 2.8.11 Q Represent functional relationships in tables, charts and graphs.

VII. The Role of Government: Analyze the role of government in economic systems, especially the role of government in the U.S. economy.

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 C Construct and apply mathematical models, including lines and curves of best fit, to estimate values of related quantities.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 C Determine the validity of an argument.
- 2.4.11 E Demonstrate mathematical solutions to problems (e.g., in the physical sciences).
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.6.11 E Determine the validity of the sampling method described in a given study.
- 2.6.11 H Use sampling techniques to draw inferences about large populations.
- 2.7.11 B Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.
- 2.7.11 C Draw and justify a conclusion regarding the validity of a probability or statistical argument.
- 2.7.11 D Use experimental and theoretical probability distributions to make judgments about the likelihood of various outcomes in uncertain situations.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.
- 2.8.11 B Give examples of patterns that occur in data from other disciplines.
- 2.8.11 C Use patterns, sequences and series to solve routine and non-routine problems.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets, and other software.

- 2.8.11 P Analyze a relation to determine whether a direct or inverse variation exists and represent it algebraically and graphically.
- 2.8.11 R Create and interpret functional models.

VIII. International Economic Concepts: Examine the role of trade, protectionism, and monetary market in the global economy.

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 D Describe and explain the amount of error that may exist in a computation using estimation.
- 2.4.11 A Use direct proofs, indirect proofs, or proof by contradiction to validate conjectures.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 C Determine the validity of an argument.
- 2.4.11 E Demonstrate mathematical solutions to problems (e.g., in the physical sciences).
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.6.11 H Use sampling techniques to draw inferences about large populations.
- 2.7.11 B Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.
- 2.7.11 C Draw and justify a conclusion regarding the validity of a probability or statistical argument.
- 2.7.11 E Solve problems involving independent simple and compound events.

IX. Aggregate Supply and Aggregate Demand: Analyze how the U.S. economy functions as a whole and describe selected macroeconomic measure of economic activity.

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 C Construct and apply mathematical models, including lines and curves of best fit, to estimate values of related quantities.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 C Determine the validity of an argument.
- 2.4.11 E Demonstrate mathematical solutions to problems (e.g., in the physical sciences).
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
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- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.6.11 E Determine the validity of the sampling method described in a given study.
- 2.6.11 H Use sampling techniques to draw inferences about large populations.
- 2.7.11 B Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.
- 2.7.11 C Draw and justify a conclusion regarding the validity of a probability or statistical argument.
- 2.7.11 D Use experimental and theoretical probability distributions to make judgments about the likelihood of various outcomes in uncertain situations.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.
- 2.8.11 B Give examples of patterns that occur in data from other disciplines.
- 2.8.11 C Use patterns, sequences and series to solve routine and non-routine problems.

- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets, and other software.
- 2.8.11 P Analyze a relation to determine whether a direct or inverse variation exists and represent it algebraically and graphically.
- 2.8.11 R Create and interpret functional models.

**NATIONAL BUSINESS EDUCATION STANDARDS
CROSS-REFERENCED WITH PENNSYLVANIA
ACADEMIC STANDARDS**

Pennsylvania *Mathematics* Standards

National Business Education *Personal Finance* Standards

- I. Personal Decision Making: Use a rational decision-making process as it applies to the roles of citizens, workers, and consumers.**
- II. Earning a Living: Identify various forms of income and analyze factors that affect income as a part of the career decision-making process.**
- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 E Demonstrate mathematical solutions to problems (e.g., in the physical sciences)
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- III. Managing Finances and Budgeting: Develop and evaluate a spending/savings plan.**
- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 E Demonstrate mathematical solutions to problems (e.g., in the physical sciences)

- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid

IV. Saving and Investing: Evaluate savings and investment options to meet short- and long-term goals.

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 E Demonstrate mathematical solutions to problems (e.g., in the physical sciences)
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid

V. Buying Goods and Services: Apply a decision-making model to maximize consumer satisfaction when buying goods and services.

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.

- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.8.11 B Give examples of patterns that occur in data from other disciplines.
- 2.8.11 D Formulate expressions, equations, inequalities, systems of inequalities and matrices to model routine and non-routine problem situations.

VI. Banking: Evaluate services provided by financial deposit institutions to transfer funds.

VII. Using Credit: Analyze factors that affect the choice of credit, the cost of credit, and the legal aspects of using credit.

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 E Demonstrate mathematical solutions to problems (e.g., in the physical sciences).
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.

VIII. Protecting Against Risk: Analyze choices available to consumers for protection against risk and financial loss.

**NATIONAL BUSINESS EDUCATION STANDARDS
CROSS-REFERENCED WITH PENNSYLVANIA
ACADEMIC STANDARDS**

Pennsylvania *Mathematics* Standards

National Business Education *Entrepreneurship* Standards

I. Entrepreneurs and Entrepreneurial Opportunities: Recognize that entrepreneurs possess unique characteristics and evaluate the degree to which one possesses those characteristics.

A. Characteristics of an Entrepreneur

B. Role of the Entrepreneur in Business

C. Opportunity Recognition and Pursuit

2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)

2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.

2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.

2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.

D. Problem Identification and Solutions

2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)

2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.

2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.

II. Marketing: Analyze customer groups and develop a plan to identify, reach, and keep customers in a specific target market.

A. Identifying the Market

B. Reaching the Market

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.8.11 Q Represent functional relationships in tables, charts and graphs.
- 2.8.11 R Create and interpret functional models.

C. Keeping/Increasing the Market

III. Economics: Apply economic concepts when making decisions for an entrepreneurial venture.

A. Economic Concepts

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.

B. Market Economy Characteristics

- 2.1.11A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.

- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.8.11 Q Represent functional relationships in tables, charts and graphs.
- 2.8.11 R Create and interpret functional models.

C. Function of Price

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which and exact answer is not needed.
- 2.2.11 C Construct and apply mathematical models, including lines and curves of best fit, to estimate values of related quantities.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.8.11 Q Represent functional relationships in tables, charts and graphs.
- 2.8.11 R Create and interpret functional models.

D. Role of Profit and Risk

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results

E. Role of Government

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which and exact answer is not needed.
- 2.2.11 C Construct and apply mathematical models, including lines and curves of best fit, to estimate values of related quantities.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.8.11 Q Represent functional relationships in tables, charts and graphs.
- 2.8.11 R Create and interpret functional models.

IV. Finance: Use the financial competencies needed by an entrepreneur.

A. Determining Cash Needs

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which and exact answer is not needed.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.

B. Identifying Sources and Types of Funding

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which and exact answer is not needed.

- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.

C. Interpreting Financial Statements

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.
- 2.8.11 D Formulate expressions, equations, inequalities, systems of equations, systems of inequalities, and matrices to model routine and non-routine problem situations.
- 2.8.11 Q Represent functional relationships in tables, charts and graphs.
- 2.8.11 R Create and interpret functional models.
- 2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).

V. Accounting: Recognize that entrepreneurs must establish, maintain, and analyze appropriate records to make business decisions.

A. Keeping Business Records

B. Identifying Types of Business Records

C. Establishing and Using Business Records

- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.

D. Interpreting Business Records

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.8.11 R Create and interpret functional models.

VI. Management: Develop a management plan for an entrepreneurial venture.

A. Establishing a Vision

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)

B. Hiring Employees

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.

C. Building Teams

D. Monitoring Achievement

E. Managing Risks

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which and exact answer is not needed.

VII. Global Markets: Analyze the effect of cultural differences, export/import opportunities, and trends on an entrepreneurial venture in the global marketplace.

A. Cultural Differences

B. Import/Export Opportunities

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which and exact answer is not needed.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.

C. Global Trends

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which and exact answer is not needed.

VIII. Legal: Analyze how forms of business ownership, government, regulations, and business ethics affect entrepreneurial ventures.

A. Forms of Business Ownership

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms)
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.

B. Government Regulations

C. Business Ethics

IX. Business Plans: Develop a business plan.

**NATIONAL BUSINESS EDUCATION STANDARDS
CROSS-REFERENCED WITH PENNSYLVANIA
ACADEMIC STANDARDS**

Pennsylvania *Mathematics* Standards

National Business Education *Information Technology* Standards

- I. Impact on Society: Assess the impact of information technology on society.**
- II. Computer Architecture: Describe current and emerging computer architecture; configure, install, and upgrade hardware; diagnose and repair hardware problems.**
- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- III. Operating Systems, Environments, and Utilities: Identify, evaluate, select, install, use, upgrade, customize, and diagnose and solve problems with various types of operating systems, environment, and utilities.**
- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11 B Construct valid arguments from stated facts.
- IV. Information Technology and Major Business Functions: Describe the information technology components of major business functions and explain their interrelationships.**
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.3.11 A Select and use appropriate units and tools to measure to the degree of accuracy required in particular measurement situations.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.

- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 D Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.6.11 E Determine the validity of the sampling method described in a given study.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.
- 2.8.11 C Use patterns, sequences and series to solve routine and non-routine problems.

V. Application Software: Identify, evaluate, select, install, use, upgrade, and customize application software; diagnose and solve problems resulting from an application software's installation and use.

- 2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.

VI. Input Technologies: Use input technologies appropriately to enter and manipulate text and data.

- 2.2.11 F Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.

VII. Information Retrieval: Gather, evaluate, use, and cite information from information technology sources.

VIII. Database Management Systems: Use, plan, develop, and maintain database management systems.

- 2.6.11 A Design and conduct an experiment using random sampling. Describe the data as an example of a distribution using statistical measures of center and spread. Organize and represent the results with graphs. (Use standard deviation, variance and t-tests.)

- 2.6.11 B Use appropriate technology to organize and analyze data taken from the local community.
- 2.6.11 D Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.
- 2.6.11 E Determine the validity of the sampling method described in a given study.
- 2.8.11 B Give examples of patterns that occur in data from other disciplines.
- 2.8.11 C Use patterns, sequences and series to solve routine and non-routine problems.
- 2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.

IX. Programming and Application Development: Design, develop, test, and implement programs.

- 2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations
- 2.2.11 B Use estimation to solve problems for which an exact answer is not needed.
- 2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
- 2.4.11 A Use direct proofs, indirect proofs or proof by contradiction to validate conjectures.
- 2.4.11 B Construct valid arguments from stated facts.
- 2.4.11 C Determine the validity of an argument.
- 2.4.11 D Use truth tables to reveal the logic of mathematical statements.
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11 C Present mathematical procedures and results clearly, systematically, succinctly and correctly.

X. Systems Analysis and Design: Analyze and design information systems using appropriate development tools.

XI. Communications and Networking Infrastructures: Develop the skills to design, deploy, and administer networks and communications systems.

- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.

2.5.11 B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.

XII. Network Applications: Use, evaluate, and deploy communications and networking applications.

2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).

2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations

2.2.11 E Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.

XIII. Information Technology Planning and Acquisition: Plan the selection and acquisition of information technologies.

XIV. Technical Support and Training: Develop the technical and interpersonal skills and knowledge to support the user community.

2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).

XV. Risk Management: Design and implement risk management policies and procedures for information technology.

XVI. Privacy and Ethics: Describe, analyze, develop, and follow policies for managing privacy and ethical issues in organizations and in a technology-based society.

XVII. Information Technology Careers: Describe positions and career paths in information technology.

2.1.11 A Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).

2.2.11 A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations

2.3.11 A Select and use appropriate units and tools to measure to the degree of accuracy required in particular measurement situations.

2.4.11 A Use direct proofs, indirect proofs or proof by contradiction to validate conjectures.

2.4.11 B Construct valid arguments from stated facts.

2.4.11 C Determine the validity of an argument.

2.4.11 D Use truth tables to reveal the logic of mathematical statements.

- 2.4.11 E Demonstrate mathematical solutions to problems (e.g., in the physical sciences).
- 2.5.11 A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.8.11 A Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.

**NATIONAL BUSINESS EDUCATION STANDARDS
CROSS-REFERENCED WITH PENNSYLVANIA
ACADEMIC STANDARDS**

Pennsylvania *Mathematics* Standards

National Business Education *International Business* Standards

- I. **Foundations of International Business: Explain the role of international business; analyze how it impacts business at all levels (including the local, state, national, and international levels).**
 - A. **Role and Impact**
 - B. **Geography**
 - C. **Career Opportunities**
 - D. **Travel Considerations**

- II. **The Global Business Environment: Describe the interrelatedness of the social, cultural, political, legal, and economic factors that shape and impact the international business environment.**
 - A. **Social and Cultural Influences**
 - B. **Political Environment**
 - C. **Legal Systems**
 - D. **Economic Environment**

- III. **International Business Communication: Apply communication strategies necessary and appropriate for effective and profitable international business relations.**
 - A. **Oral and Written Communication**
 - B. **Nonverbal Communication**
 - C. **Negotiations**
 - D. **Technology**

- IV. **Global Business Ethics: Describe the environmental factors that define what is considered ethical business behavior in a global business environment.**

- V. **Organizational Structures for International Business Activities: Identify forms of business ownership and entrepreneurial opportunities available in international business.**
 - A. **Forms of Business Ownership**
 - B. **Entrepreneurial Opportunities**
 - C. **International Business Involvement**
 - D. **International Business Success**

- VI. **International Trade Relations: Relate balance of trade concepts to the import/export process.**
 - A. **Importing and Exporting**
 - B. **Trade Barriers and Agreements**
 - C. **Balance of Trade**

- VII. **International Management: Analyze special challenges in operations in human resource management in international business.**
 - A. **Operations and Production**
 - B. **Human Resources**
 - C. **Strategic Management**

- VIII. **International Marketing: Apply marketing concepts to international business situations.**
 - A. **Foreign Markets and Consumer Behavior**
 - B. **Marketing Research**
 - C. **Product Development**
 - D. **Standards and Measures**
 - 2.3.11 C Demonstrate the ability to produce measures with specified levels of precision.
 - E. **Pricing Strategies**

- F. Distribution Channels and Intermediaries**
- G. Transportation and Shipping**
- H. Promotional Activities**
- IX. International Finance: Explain the concepts, role, and importance of international finance and risk management.**
 - A. Currency and Exchange**
 - B. Financial Institutions and Trade Agreements**
 - C. Payment Methods and Reporting**
 - D. Risk Management**

**NATIONAL BUSINESS EDUCATION STANDARDS
CROSS-REFERENCED WITH PENNSYLVANIA
ACADEMIC STANDARDS**

Pennsylvania *Mathematics* Standards

National Business Education *Management* Standards

- I. **Management Functions: Analyze the management functions and their implementation and integration within the business environment.**
 - A. **Planning**
 - B. **Organizing**
 - C. **Leading/Directing**
 - D. **Evaluation/Controlling**

- II. **Management Theories: Analyze management theories and their application within the business environment.**

- III. **Business Organization: Analyze the organization of a business.**
 - A. **Forms of Business Ownership**
 - B. **Management Levels**
 - C. **Organizational Structure**

- IV. **Personal Management Skills: Develop personal management skills to function effectively and efficiently in a business environment.**
 - A. **Time Management**
 - B. **Stress Management**
 - C. **Professional Growth and Development**
 - D. **Communication Skills**
 - E. **Relationship Building**

- V. **Ethics and Social Responsibility:** Examine the role of ethics and social responsibility in decision making.
 - A. Ethics
 - B. Social Responsibility

- VI. **Human Resource Management:** Describe human resource functions and their importance to an organization's successful operation.
 - A. Human Resource Planning
 - B. Recruitment and Selection
 - C. Employee Development
 - D. Evaluation
 - E. Compensation, Promotion, Benefits, and Incentives
 - F. Separations, Termination, and Transition
 - G. Labor Relations

- VII. **Organized Labor:** Describe the role of organized labor and its influence on government and business.

- VIII. **Technology and Information Management:** Utilize information and technology tools to conduct business effectively and efficiently.
 - A. Technology Tools
 - B. Information Management
 - C. E-Business

- IX. **Industry Analysis:** Analyze a business organization's competitive position within the industry.
 - A. Competition
 - B. Competitive Advantage
 - C. Internal and External sources of Data

- X. **Financial Decision Making:** Analyze financial data influenced by internal and external factors in order to make short-term and long-term decisions.
 - A. Financial Statements
 - B. Short-Term and Long-Term Financing
 - C. Risk Management

- XI. **Operations Management:** Apply operations management principals and procedures to the design of an operations plan.
 - A. Product Design (Goods/Services)
 - B. Scheduling
 - C. Materials Procurement
 - D. Inventory Management
 - E. Quality Standards

- XII. **Global Perspective:** Examine the issues of managing in the global environment.
 - A. Legal Issues
 - B. Economic Considerations
 - C. Workplace Diversity
 - D. Global Partnering