Alabama Mathematics

Career Mathematics (2015): Grades 9, 10, 11, 12

Adopted 2015

Measurement

1. **Critique the appropriateness of measurements in terms of precision, accuracy, and approximate error.** CM.1
   a. Determine dimensions by scaling plans or blueprints. CM.1.A
   b. Apply knowledge of fractions for reading a ruler to 1/16 inch. CM.1.B
   c. Convert decimals to fractions for interpreting blue prints and measuring materials. CM.1.C
   d. Compare Metric and English systems of measurements used in industry. CM.1.D
   e. Identify various measuring tools and demonstrate their use to verify precision, accuracy, and approximate error. CM.1.E

2. **Use ratios of perimeters, areas, and volumes of similar figures to solve applied problems.** CM.2
   a. Calculate area utilizing the Pythagorean Theorem. CM.2.A
   b. Demonstrate an understanding of blueprints and drawings. CM.2.B
   c. Calculate estimates for construction or repair projects. CM.2.C

Entrepreneurial Economics and Finances

3. **Use algebraic and geometric reasoning and problem-solving skills to make informed financial and economic decisions, including those involving banking and investments, insurance, personal budgets, credit purchases, recreation, and deceptive and fraudulent pricing and advertising.** CM.3
   a. Create graphs and tables related to personal finance and economics. The use of appropriate technology is encouraged for numerical and graphical investigations. CM.3.A
   b. Analyze job opportunities and career pathways related to business or industry. CM.3.B
   c. Evaluate the economics of establishing and owning a business. CM.3.C
   d. Make inferences and justify conclusions from economic conditions that can affect hiring and layoff decisions. CM.3.D

4. **Use formulas or equations of functions to calculate outcomes and analyze models of exponential growth or decay.** CM.4
    a. Interpret depreciation cost of decay relationships. CM.4.A

5. **Approximate rates of change of nonlinear relationships from graphical and numerical data.** CM.5
    a. Graph functions expressed in tables, equations, or classroom-generated data to model consumer costs and to predict future outcomes. CM.5.A
    b. Analyze interest rates, depreciation, and tax rates in order to determine how each affects the cost of owning and/or operating a business. CM.5.B

6. **Summarize and interpret data represented in tables or graphs in order to make predictions.** CM.6
    a. Predict trends about population change that will affect employment rate. CM.6.A
    b. Calculate pay scale based on occupational outlook projections. CM.6.B
    c. Calculate operating costs, including cost of materials, supplies, equipment, license fees, and insurance fees. CM.6.C
    d. Construct charts that reflect current demographics in various industries. CM.6.D
    e. Forecast growth and decline of various career fields by interpreting data from charts and graphs. CM.6.E

Algebra

7. **Analyze and solve application-based problems relating to direct, inverse, and joint variation.** CM.7
    a. Utilize mathematical skills for trouble-shooting in business and industrial applications. CM.7.A

8. **Calculate the maximum and minimum values of a function using linear programming procedures.** CM.8

9. **Use the maximum value of a given quadratic function to solve applied problems.** CM.9
    a. Calculate operation cost to maximize profit. CM.9.A
    b. Calculate appropriate materials to use for an application. CM.9.B

Geometry

10. **Solve application-based situations by using the properties of right triangles, including trigonometric ratios.** CM.10
    a. Determine overall angles or dimensions while working with various materials. CM.10.A
    b. Use trigonometric ratios to apply properties of a right triangle to drawings or blueprints. CM.10.B

11. **Analyze and interpret the aesthetics of real-life situations using line symmetry, rotational symmetry, or the golden ratio.** CM.11

    a. Design drawings or blueprints to include pictorial, top, front, sides, back, and detailed views. CM.11.A

    b. Construct a project from designed drawings. CM.11.B

12. **Apply arc lengths and areas of sectors of circles to solve problems.** CM.12

    a. Determine allowable geometric tolerance in various industrial applications. CM.12.A

Data Analysis and Probability

13. **Estimate the equation of a curve of best fit from tables of values or scatter plots to model a set of data.** CM.13

    a. Formulate tables from occupational outlook data to predict employment rates in various industrial areas. CM.13.A

    b. Construct scatter plots to analyze data and develop a plan that is most suitable for the application. CM.13.B

14. **Estimate probabilities given a frequency distribution.** CM.14

    a. Make decisions basis on probabilities. CM.14.A