

Integrated 1 Mathematics Priority Standards

A central theme in Integrated 1 is functions including linear, quadratic and exponential. Students learn that functions are used to solve various types of problems. Students learn to write equations that represent a problem and use functions as tools to solve other problems. Students learn to generalize rules.

M1.1 Core Content: Solving problems (Algebra)

- M1.1.A:** Select and justify functions and equations to model and solve problems.
- M1.1.B:** Solve problems that can be represented by linear functions, equations, and inequalities.
- M1.1.C:** Solve problems that can be represented by a system of two linear equations or inequalities.
- M1.1.D:** Solve problems that can be represented by exponential functions and equations.

M1.2 Core Content: Characteristics and behaviors of functions (Algebra)

- M1.2.A** Determine whether a relationship is a function and identify the domain, range, roots, and independent and dependent variables.
- M1.2.B** Represent a function with a symbolic expression, as a graph, in a table, and using words, and make connections among these representations.
- M1.2.C** Evaluate $f(x)$ at a (i.e., $f(a)$) and solve for x in the equation $f(x) = b$.
- M1.2.D:** Plot points, sketch, and describe the graphs of functions of the form $f(x) = a/x + b$

M1.3 Core Content: Linear functions, equations and relationship (Algebra, Geometry/Measurement/Data/Statistics/Probability)

- M1.3.A** Write and solve linear equations and inequalities in one variable.
- M1.3.B** Describe how changes in the parameters of linear functions and functions containing an absolute value of a linear expression affect their graphs and the relationships they represent.
- M1.3.C** Identify and interpret the slope and intercepts of a linear function, including equations for parallel and perpendicular lines.
- M1.3.D** Write and graph an equation for a line given the slope and the y-intercept, the slope and a point on the line, or two points on the line, and translate between forms of linear equations.
- M1.3.E** Write and solve systems of two linear equations and inequalities in two variables.
- M1.3.F** Find the equation of a linear function that best fits bivariate data that are linearly related, interpret the slope and y-intercept of the line, and use the equation to make predictions.
- M1.3.G** Describe the correlation of data in scatter plots in terms of strong or weak and positive or negative.
- M1.3.H** Determine the equation of a line in the coordinate plane that is described geometrically, including a line through two given points, a line through a given point parallel to a given line, and a line through a given point perpendicular to a given line.

M1.4 Core Content: Proportionality, similarity and geometric reasoning (Geometry/Measurement)

- M1.4.A** Distinguish between inductive and deductive reasoning.
- M1.4.B** Use inductive reasoning to make conjectures, to test the plausibility of a geometric statement, and to help find a counterexample.
- M1.4.C** Use deductive reasoning to prove that a valid geometric statement is true.
- M1.4.D** Determine and prove triangle similarity.
- M1.4.E** Know, prove, and apply theorems about parallel and perpendicular lines.
- M1.4.F** Know, prove, and apply theorems about angles, including angles that arise from parallel lines intersected by a transversal.
- M1.4.G** Explain and perform basic compass and straightedge constructions related to parallel and perpendicular lines.

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M1.5 Core Content: Data and distributions (Data/Statistics/Probability)

- M1.5.A Use and evaluate the accuracy of summary statistics to describe and compare data sets.
- M1.5.B Describe how linear transformations affect the center and spread of univariate data.
- M1.5.C Make valid inferences and draw conclusions based on data.

M1.6 Core Content: Numbers, expressions and operations (Numbers, Operations, Algebra)

- M1.6.A Know the relationship between real numbers and the number line, and compare and order real numbers with and without the number line.
- M1.6.B Determine whether approximations or exact values of real numbers are appropriate, depending on the context, and justify the selection.
- M1.6.C Recognize the multiple uses of variables, determine all possible values of variables that satisfy prescribed conditions, and evaluate algebraic expressions that involve variables.
- M1.6.D Solve an equation involving several variables by expressing one variable in terms of the others.

M1.7 Additional Key Content: (Measurement)

- M1.7.A Sketch the graph for an exponential function of the form $y = ab^n$ where n is an integer, describe the effects that changes in the parameters a and b have on the graph, and answer questions that arise in situations modeled by exponential functions.
- M1.7.B Find and approximate solutions to exponential equations.
- M1.7.C Interpret and use integer exponents and square and cube roots, and apply the laws and properties of exponents to simplify and evaluate exponential expressions.
- M1.7.D Express arithmetic and geometric sequences in both explicit and recursive forms, translate between the two forms, explain how rate of change is represented in each form, and use the forms to find specific terms in the sequence.

M1.8 Core Processes: Reasoning, problem solving and communication

- M1.8.A Analyze a problem situation and represent it mathematically.
- M1.8.B Select and apply strategies to solve problems.
- M1.8.C Evaluate a solution for reasonableness, verify its accuracy, and interpret the solution in the context of the original problem.
- M1.8.D Generalize a solution strategy for a single problem to a class of related problems, and apply a strategy for a class of related problems to solve specific problems.
- M1.8.E Read and interpret diagrams, graphs, and text containing the symbols, language, and conventions of mathematics.
- M1.8.F Summarize mathematical ideas with precision and efficiency for a given audience and purpose.
- M1.8.G Synthesize information to draw conclusions, and evaluate the arguments and conclusions of others.
- M1.8.H Use inductive reasoning about algebra and the properties of numbers to make conjectures, and use deductive reasoning to prove or disprove conjectures.