

Grade 10 Mathematics

The grade 10 mathematics assessment presents a variety of items representing the six strands of the Wisconsin Model Academic Standards for Mathematics: Mathematical Processes (*Reasoning, Communication, Connections, Representation, Problem Solving*), Number Operations and Relationships, Geometry, Measurement, Statistics and Probability, and Algebraic Relationships. Assessment items in each category may appear without context and within the context of real-world situations. All test items are either selected-response (multiple-choice) or constructed response format. Some items require the use of mathematical tools including a protractor, a ruler with 1/16 inch and millimeter intervals, and calculators (scientific or graphing calculator availability is required for most sessions of the test). Students performing at each level draw on a broad range of mathematical knowledge while applying skills and strategies to solve real-world and nonroutine mathematical problems. Each proficiency level presumes mastery at previous levels.

Advanced

Score range: 595 and above

At the beginning of tenth grade, students performing at the Advanced level convey mathematical ideas using the vocabulary of mathematics and provide detailed written communication about the reasonableness of their conclusions based upon calculations, models, and arguments using the Pythagorean Theorem, logical reasoning, and data analysis. Students analyze and solve problems using percents. Students classify geometric figures using properties and theorems, evaluate the validity of geometric figures using logical reasoning, apply properties of parallel lines, and locate intercepts of linear and quadratic equations with the use of a calculator. They describe transformations of figures and reflect geometric figures over any line of symmetry on a coordinate plane. Students calculate the value of an angle using multiple angle relationships and apply triangle congruence theorems. They analyze data and draw conclusions regarding the effects of outliers in a set of data, compare and analyze box-and-whisker plots, identify appropriate ranges of values using standard deviation, and calculate the probability or number of outcomes of an event. Students generalize patterns of various sequences, write linear equations when given two points, translate verbal problems into linear or quadratic equations without a calculator, and solve problems using algebraic methods.

Proficient

Score range: 541–594

At the beginning of tenth grade, students performing at the Proficient level provide justifications for their solutions and provide details to support their reasoning. Students solve a variety of problems using familiar percents. They apply angle relationships in a circle to solve problems and locate and plot coordinates of geometric figures transformed in a coordinate plane. Students use the Pythagorean Theorem and distance and mid-point formulas. They calculate the area of two-dimensional shapes. Students determine missing information using Venn diagrams, create scatter plots with appropriate scales and labels, and interpret the graph of quadratic relationships. They solve

multi-step linear and non-linear equations or inequalities, and determine and extend patterns involving real-world context.

Basic

Score range: 516–540

At the beginning of tenth grade, students performing at the Basic level represent processes in real-world situations and provide justifications for their solutions. They test and communicate the reasonableness of solutions. Students add, subtract, multiply, and divide integers. They identify similar geometric figures using ratios, recognize supplementary angle relationships, and determine the missing length of a right triangle. Students approximate linear and area measurements. They analyze the relationship between linear and non-linear sets of data, select appropriate sample sets for surveys, calculate the probability of a single event, and predict values beyond the range of a linear graph. Students describe relationships among variable quantities, translate real-world data into algebraic equations with two variables, and determine the slope of a line. They translate verbal expressions into algebraic expressions and demonstrate the use of algebraic properties to solve multiple-step linear equalities and inequalities.

Minimal Performance

Score range: 515 and below

At the beginning of tenth grade, students performing at the Minimal Performance level use simple explanations to support their conclusions. Students order real numbers and add and subtract decimals without the use of calculators. Students classify two and three-dimensional figures, identify corresponding parts of congruent figures, and determine the location of more than one ordered pair using the four quadrant coordinate system. Students select appropriate units of measurement, convert within US customary or metric systems of measure, use appropriate tools and techniques to measure to the nearest unit, and estimate area. Students interpret data from tables and linear graphs, including constant functions; determine mean, median, mode and range of a set of data; and predict the likelihood of a single event. Students apply associative, commutative, or distributive properties to solve multi-step algebraic equations.