

Grade 10 Mathematics Performance Level Descriptors

Advanced: Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the **Advanced** level perform multiple operations to simplify square roots. Students multiply and factor higher order polynomial expressions. Students apply complex counting procedures to determine sample space size and justify their reasoning. Students calculate experimental probabilities of multiple complex events, interpreting the results and making predictions. Students solve complex and non-routine real-world problems, draw logical conclusions, and justify solutions.

Proficient: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the **Proficient** level simplify cube roots and perform operations on square roots. Students multiply binomials, factor quadratic expressions, and evaluate expressions using nonstandard operations. Students represent, solve, and graph linear equations and systems, linear inequalities and systems, absolute value equations, and inequalities. Students solve literal equations, recognize and extend arithmetic and geometric sequences, and interpret geometric sequences. Students calculate, interpret, and compare characteristics of lines, write the equation of a line, translate between various representations, and interpret, evaluate, and graph functions and identify their characteristics. Students predict the effects of transformations on parent graphs. Students perform operations on functions. Students analyze data sets. Students determine regression lines and correlation coefficients to make predictions and assess the reliability of those predictions. Students calculate, evaluate, and apply probability concepts. Students use coordinate geometry to analyze line segments and polygons and apply the properties and theorems of lines, angles, and polygons to solve problems. Students solve real-world problems and employ problem-solving strategies of identifying and using appropriate information.

Limited Knowledge: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the **Limited Knowledge** level simplify, add, and subtract square roots. Students add and subtract polynomials and functions, multiply a monomial by a polynomial, and factor common monomial factors from polynomial expressions. Students evaluate linear, absolute value, rational, and radical expressions. Students solve and graph linear equations and systems, linear inequalities and systems, compound inequalities, and absolute value equations. Students solve simple literal equations. Students extend arithmetic and geometric sequences. Students calculate the slope and the intercepts of a line using a graph, an equation, two points, or a set of data points. Students solve mathematical problems involving lines that are parallel, perpendicular, horizontal, or vertical. Students convert equations of a line to slope intercept form. Students write the equation of a line in point slope form given a point and slope. Students identify a graph given a situation described qualitatively. Students identify characteristics of a function given a table or graph. Students read the graph of a linear piecewise function and evaluate a function algebraically at a given point in its domain. Students describe, calculate, and make predictions using data sets and calculate simple probabilities and determine sample space size. Students use coordinate geometry to represent line segments and polygons.

Unsatisfactory: Students have not performed at least at the Limited Knowledge level. Students scoring at the **Unsatisfactory** level should be given comprehensive mathematical instruction.