ILLINOIS STATE BOARD OF EDUCATION

MATHEMATICS HIGH SCHOOL NUMBERS & QUANTITY

Theory of Action: Academic standards represent a collective commitment around what students should learn each year. The state assessment asks students to demonstrate their knowledge, skills, and understanding related to these standards using a common measure. The resulting data allows us to see patterns in performance that should guide school and district improvement, helping identify areas of strength and opportunity.

Role of Performance Level Descriptors in Defining Proficiency: Performance level descriptors bridge the state assessment to classroom instruction and the systems of formative assessments that guide local instruction and choices about individual students. *Academic proficiency represents a <u>range</u> of observable student performance characteristics*. There are multiple pathways to proficiency, and students rely upon their strengths differently within that range of performance.

Proficiency and Difficulty: A student's ability to demonstrate proficiency is influenced by the complexity of the texts or stimuli presented, tasks they're asked to complete, and the contexts in which they are engaged. As student performance improves, students are typically able to handle more challenging texts/stimuli, tasks, and contexts, and are able to demonstrate their skills and knowledge more accurately and consistently.

Numbers & Quantity *Student performance indicates the ability to…*

Claim 1	Below Proficient	Approaching Proficient	Proficient	Above Proficient
RN.1-2	Apply integer exponent properties (e.g., simplify expressions involving integer exponents. Identify equivalent expressions with integer exponents). Compute basic exponential expressions.	Write roots as rational exponents and rational exponents as roots.	Apply properties of rational exponents. For example, perform operations on expressions involving radicals and rational exponents using the properties of exponents. Compute exponential expressions with rational exponents and real number bases. Simplify exponential expressions with rational exponents with variable bases.	Recognize rational exponents in contexts. Apply properties of exponents to solve (multi-step) equations involving rational exponents.
RN.3	Identify numbers as rational and irrational. Classify numbers as rational or irrational. Approximate the placement of irrational numbers on the real number line/graph or compare relative to available rational numbers.	Perform addition and multiplication operations with rational and irrational numbers.	Justify how the sum and product of two rational, nonzero numbers are rational even if the answer is unknown. Demonstrate how the sum of two irrational numbers elicits an irrational value. Justify how the sum of a rational number and an irrational number is irrational.	Apply properties of rational and irrational numbers to contexts like area and volume to identify reasonable answers.

Numbers & Quantity   *Student performance indicates the ability to…*

Claim 2	Below Proficient	Approaching Proficient	Proficient	Above Proficient
CN.1-2	Identify real and imaginary components of a complex number.	Perform sums and differences of complex numbers. Rewrite negative radicands as a complex number.	Simplify algebraic expressions with complex numbers. Calculate the product and quotient of two complex numbers. Calculate powers of i. Simplify algebraic expressions that require multiple steps and algebraic properties of equality.	Create and apply problems with complex numbers that involve higher order manipulation.
CN.7	Find solutions to quadratic equations with complex solutions by graphing. Identify the complex solutions in the factored form.	Recognize the conjugate pairs solutions for a polynomial with real coefficients.	Perform quadratic formula, completing the square or factoring to find complex zeros in a quadratic equation.	Perform multiple steps to find complex solutions to polynomial equations with a degree greater than 2.