MATH BENCHMARKS ASSESSED AT GRADES 9-10

SUNSHINE STATE STANDARDS BENCHMARK	ITEM FORMATS	
GRADES 9-10	Grade 9	Grade 10
STRAND A: NUMBER SENSE, CONCEPTS, AND OPERATIONS		
MA.A.1.4.1 associates verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, and complex numbers.	Assessed with A. 1.4.4	Assessed with A. 1.4.4
MA.A.1.4.2 understands the relative size of integers, rational numbers, irrational numbers, and real numbers.	MC	MC
MA.A.1.4.3 understands concrete and symbolic representations of real and complex numbers in real- world situations.	Assessed with A. 1.4.4	Assessed with A. 1.4.4
MA.A.1.4.4 understands that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, and logarithms. (Also assesses A.1.4.1 and A.1.4.3)	MC, GR	MC, GR
MA.A.2.4.1 understands and uses the basic concepts of limits and infinity.	Not assessed	Not assessed
MA.A.2.4.2 understands and uses the real number system.	Assessed with A.3.4.1, A.3.4.2, and A.3.4.3	Assessed with A.3.4.1, A.3.4.2, and A.3.4.3
MA.A.2.4.3 understands the structure of the complex number system.	Not assessed	Not assessed
MA.A.3.4.1 understands and explains the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships. (Also assesses A.2.4.2)	MC	MC
MA.A.3.4.2 selects and justifies alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, transitive, that allow operational shortcuts for computational procedures in real- world or mathematical problems. (Also assesses A.2.4.2 and A.3 .3 .2)	MC	MC
MA.A.3.4.3 adds, subtracts, multiplies, and divides real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator. (Also assesses A.2.4.2)	MC, GR	MC, GR
MA.A.4.4.1 uses estimation strategies in complex situations to predict results and to check the reasonableness of results. (Also assesses A.4.2.1 andB.3.4.1)	MC	MC
MA.A.5.4.1 applies special number relationships such as sequences and series to real-world problems.	Not assessed	Not assessed

MC: multiple-choice
GR: gridded-response
SR: short-response
ER: extended-response

MATH BENCHMARKS ASSESSED AT GRADES 9-10 (CONTINUED)

SUNSHINE STATE STANDARDS BENCHMARK	ITEM FORMATS	
GRADES 9-10	Grade 9	Grade 10
STRAND B: MEASUREMENT		
MA.B.1.4.1 uses concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids. (Also assesses B.I. 2.2 and B.I. 4.2)	MC, GR	MC, GR, SR
MA.B.1.4.2 uses concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, and arc lengths. (Also assesses B.1.2.2)	MC, GR	MC, GR
MA.B.1.4.3 relates the concepts of measurement to similarity and proportionality in real- world situations.	MC, GR	Assessed with C.2.4.1
MA.B.2.4.1 selects and uses direct (measured) or indirect (not measured) methods of measurement as appropriate.	MC, GR	MC
MA.B.2.4.2 solves real-world problems involving rated measures (miles per hour, feet per second). (Also assesses B.2.3.2)	MC, GR	MC, GR
MA.B.3.4.1 solves real- world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume, and estimates the effects of measurement errors on calculations.	Assessed with A.4.4.1	Assessed with A.4.4.1
MA.B.4.4.1 determines the level of accuracy and precision, including absolute and relative errors or tolerance, required in real-world measurement situations.	Not assessed	Not assessed
MA.B.4.4.2 selects and uses appropriate instruments, technology, and techniques to measure quantities in order to achieve specified degrees of accuracy in a problem situation.	Not assessed	Not assessed
STRAND C: GEOMETRY AND SPATIAL SENSE		
MA.C.1.4.1 uses properties and relationships of geometric shapes to construct formal and informal proofs. (Also assesses C.l.2.1 and C.1.3.1)	MC, GR	MC, GR
MA.C.2.4.1 understands geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips (reflections), slides (translations), turns (rotations), enlargements, rotations, and fractals. (Also assesses B.1.4.3, C.1.4.1, and C.3.4.1)	MC, GR	MC, GR, ER
MA.C.2.4.2 analyzes and applies geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).	Not assessed	MC
MA.C.3.4.1 represents and applies geometric properties and relationships to solve real- world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry. (Also assesses C.2.4.1)	MC, GR	MC, GR
MA.C.3.4.2 using a rectangular coordinate system (graph), applies and algebraically verifies properties of two- and three-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity. (Also assesses C.3.3.2 and D.2.4.1)	MC, GR	MC, GR, SR

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SUNSHINE STATE STANDARDS BENCHMARK	ITEM FORMATS	
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STRAND D: ALGEBRAIC THINKING		
MA.D.1.4.1 describes, analyzes, and generalizes relationships, patterns, and functions using words, symbols, variables, tables, and graphs.	MC, GR	MC, GR
MA.D.1.4.2 determines the impact when changing parameters of given functions.	MC, GR	MC, GR, SR
MA.D.2.4.1 represents real- world problem situations using finite graphs, matrices, sequences, series, and recursive relations.	Assessed with C.3.4.2 and D.2.4.2	Assessed with C.3.4.2 and D.2.4.2
MA.D.2.4.2 uses systems of equations and inequalities to solve real- world problems graphically, algebraically, and with matrices. (Also assesses D.2.3.1, D.2.3.2, and D.2.4.1)	MC, GR	MC, GR, SR
STRAND E: DATA ANALYSIS AND PROBABILITY		
MA.E.1.4.1 interprets data that has been collected, organized, and displayed in charts, tables, and plots. (Also assesses E.1.3.1 and E.1.4.3)	MC, GR	MC, GR, ER
MA.E.1.4.2 calculates measures of central tendency (mean, median, and mode) and dispersion (range, standard deviation, and variance) for complex sets of data and determines the most meaningful measure to describe the data. (Also assesses E.1.4.3)	MC, GR	MC, GR
MA.E.1.4.3 analyzes real- world data and makes predictions of larger populations by applying formulas to calculate measures of central tendency and dispersion using the sample population data, and using appropriate technology, including calculators and computers.	Assessed with E.1.4.1 and E.1.4.2	Assessed with E.1.4.1 and E.1.4.2
MA.E.2.4.1 determines probabilities using counting procedures, tables, tree diagrams, and formulas for permutations and combinations. (Also assesses E.2.4.2)	MC, GR	MC, GR
MA.E.2.4.2 determines the probability for simple and compound events as well as independent and dependent events.	Assessed with E.2.4.1	Assessed with E.2.4.1
MA.E.3.4.1 designs and performs real- world statistical experiments that involve more than one variable, then analyzes results and reports findings. (Also assesses E.3.3.1 and E.3.4.2)	MC	MC
MA.E.3.4.2 explains the limitations of using statistical techniques and data in making inferences and valid arguments.	Assessed with E.3.4.1	Assessed with E.3.4.1

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