Grade 8 Math C1 TD

Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.	
Content Domain: **Expressions and Equations**	
Target D [m]: Analyze and solve linear equations and pairs of simultaneous linear equations. (DOK 2) Tasks for this target will ask students to solve systems of two linear equations in two variables algebraically and estimate solutions graphically. Some problems will ask students to recognize simple cases of two equations that represent the same line or that have no solution. This target may be combined with 8.F Target F to create problems where students determine a point of intersection given an initial value and rate of change, including cases where no solution exists. Real world and mathematical problems that lead to two linear equations in two variables will be assessed in connection with targets from Claims 2 and 4.	
Standards:	8.EE.7, 8.EE.8
DOK Target(s):	1, 2
Evidence Required:	1. The student identifies and writes examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. 2. The student solves linear equations with rational number coefficients, including equations with solutions that require expanding expressions using the distributive property and collecting like terms. This includes solving real-world and mathematical problems leading to linear equations with rational number coefficients. 3. The student solves systems of two linear equations in two variables algebraically. This includes solving real-world and mathematical problems leading to two linear equations in two variables. 4. The student estimates solutions to systems of two linear equations in two variables by graphing the equations. This includes estimating solutions to real-world and mathematical problems that lead to two linear equations in two variables. 5. The student recognizes when a system of equations has one solution, has no solution, or represents the same line.
Allowable Item Types*:	SR, CR, TE
Task Models:	1. SR (DOK 1) **Prompt Features:** The student is prompted to identify one or more examples of linear equations in one variable with one solution, infinitely many solutions, and/or no solutions. **Stimulus:** The student is presented with one or more linear equations in one variable with one solution, infinitely many

	solutions, and/or no solutions. 1. CR (DOK 2) **Prompt Features:** The student is prompted to write one or more examples of linear equations in one variable with one solution, infinitely many solutions, and/or no solutions. Or the student is prompted to explain why one or more examples of linear equations in one variable have one solution, infinitely many solutions, and/or no solutions. **Stimulus:** The student is presented with one or more linear equations in one variable with one solution, infinitely many solutions, and/or no solutions. 1. TE (DOK 2) **Prompt Features:** The student is prompted to classify linear equations in one variable as having one solution, infinitely many solutions, or no solutions. **Stimulus:** The student is presented with linear equations in one variable with one solution, infinitely many solutions, or no solutions. **Interaction:** The student uses a tool that will drag and drop equations into a classification table. 2. SR (DOK 2) **Prompt Features:** The student is prompted to identify the solutions to linear equations with rational number coefficients, including equations with solutions that require expanding expressions using the distributive property and collecting like terms. Or the student is prompted to identify one or more equations with a given solution. Or the student is prompted to identify one or more coefficients and/or constants that will make a given equation have a given solution. **Stimulus 1:** The student is presented with a linear equation with rational number coefficients or a scenario that can be modeled by a linear equation. The stimulus may be in a pure or real-world context. Variables may be on either side of the equal sign. **Stimulus 2:** The student is presented with a solution to a linear equation. The stimulus and options may be in pure or real-world contexts. **Stimulus 3:** The student is presented with a linear equation with one or more unknown coefficients and/or constants and a solution to the linear equation. The stimulus may be in a pure or real-world context. Variables may be on either side of the equal sign. 2. CR (DOK 2) **Prompt Features:** The student is prompted to solve linear equations with rational number coefficients, including equations with solutions that require expanding expressions using the distributive property and collecting like terms. Or the student is prompted to create one or more equations with a given solution. Or the student is prompted to determine one or more coefficients

	and/or constants that will make a given equation have a given solution. **Stimulus 1:** The student is presented with a linear equation with rational number coefficients or a scenario that can be modeled by a linear equation. The stimulus may be in a pure or real-world context. Variables may be on either side of the equal sign. **Stimulus 2:** The student is presented with a solution to a linear equation. The stimulus may be in a pure or real-world context. **Stimulus 3:** The student is presented with a linear equation with one or more unknown coefficients and/or constants and a solution to the linear equation. The stimulus may be in a pure or real-world context. Variables may be on either side of the equal sign. 3. SR (DOK 2) **Prompt Features:** The student is prompted to identify the solution to a system of two linear equations in two variables. Or the student is prompted to identify systems of two linear equations in two variables with given solutions. Or the student is prompted to identify the system of two linear equations in two variables that models a real-world or mathematical problem. Or the student is prompted to identify one or more real-world or mathematical problems that can be modeled by a given system of two linear equations in two variables. **Stimulus 1:** The student is presented with a system of two linear equations in two variables. The system may be given in the form of a real-world or mathematical problem. If equations are given, they may be in any form, including standard and slope-intercept. **Stimulus 2:** The student is presented with the solution to a system of two linear equations in two variables. The student may need to identify one or more systems of equations, real-world problems, or mathematical problems that have the given solution. **Stimulus 3:** The student is presented with a real-world or mathematical problem. **Stimulus 4:** The student is presented with a system of two linear equations in two variables. The equations may be in any form, including standard and slope-intercept. 3. CR (DOK 2) **Prompt Features:** The student is prompted to solve a system of two linear equations in two variables, possibly showing an algebraic solution path as well. Or the student is prompted to create or complete a system of two linear equations in two variables with a given solution. Or the student is prompted to create or complete the system of two linear equations in two variables that models a real-world or mathematical problem. Or the student is prompted to create or complete one or more real-world or mathematical problems that can be modeled by a given system of two linear equations in two variables. **Stimulus 1:** The student is presented with a system of two linear equations in two variables. The system may be given in the form of a real-world or mathematical problem. If equations are given, they

	may be in any form, including standard and slope-intercept. **Stimulus 2:** The student is presented with the solution to a system of two linear equations in two variables. The student may need to create or complete one or more systems of equations, real-world problems, or mathematical problems that have the given solution. **Stimulus 3:** The student is presented with a real-world or mathematical problem. **Stimulus 4:** The student is presented with a system of two linear equations in two variables. The equations may be in any form, including standard and slope-intercept. 4. SR (DOK 1, 2) **Prompt Features:** The student is prompted to identify the approximate solution to a system of two linear equations in two variables by looking at a graph of the equations. Or the student is prompted to identify one or more graphs that show systems of two linear equations in two variables with given solutions. Or the student is prompted to identify the graph of a system of two linear equations in two variables that models a real-world or mathematical problem. Or the student is prompted to identify one or more real-world or mathematical problems that can be modeled by a given graph of a system of two linear equations in two variables. **Stimulus 1:** The student is presented with a graph of a system of two linear equations in two variables. **Stimulus 2:** The student is presented with the solution to a system of two linear equations in two variables. **Stimulus 3:** The student is presented with a real-world or mathematical problem. **Stimulus 4:** The student is presented with a graph of a system of two linear equations in two variables. 4. CR (DOK 1, 2) **Prompt Features:** The student is prompted to estimate the solution to a system of two linear equations in two variables by looking at a graph of the equations. Or the student is prompted to create or complete one or more real-world or mathematical problems that can be modeled by a given graph of a system of two linear equations in two variables. **Stimulus:** The student is presented with a graph of a system of two linear equations in two variables. 4. TE (DOK 2) **Prompt Features:** The student is prompted to graph systems of two linear equations in two variables and possibly state the solutions of the systems. Or the student is prompted to graph one or more systems of two linear equations in two variables with a given solution. **Stimulus 1:** The student is presented with a system of two linear equations in two variables. The system may be given in the form of

	a real-world or mathematical problem. If equations are given, they may be in any form, including standard and slope-intercept. **Stimulus 2:** The student is presented with the solution to a system of two linear equations in two variables. **Interaction:** The student uses a tool that plots points and draws lines through points to graph systems of linear equations. 5. SR (DOK 1) **Prompt Features:** The student is prompted to identify systems of two linear equations in two variables that have one solution, have no solution, or represent the same line. **Stimulus:** The student is presented with systems of two linear equations in two variables. The systems may be represented by equations, by graphs, or by real-world or mathematical problems. Equations may be in any form, including standard and slope-intercept. 5. CR (DOK 2) **Prompt Features:** The student is prompted to create or complete a system of two linear equations in two variables that has one solution, has no solution, or represents the same line. Or the student is prompted to state the number of solutions to a system of two linear equations in two variables and justify the answer. **Stimulus 1:** The student is presented with the number of solutions that systems of two linear equations in two variables must have and instructions about whether a system of equations or a problem (real-world or mathematical) must be created or completed. **Stimulus 2:** The student is presented with a system of two linear equations in two variables. The system may be represented by equations, by graphs, or by real-world or mathematical problems. Equations may be in any form, including standard and slope-intercept. 5. TE (DOK 1) **Prompt Features:** The student is prompted to graph systems of two linear equations in two variables with one solution or no solutions. **Stimulus:** The student is presented instructions about whether to graph a system of two linear equations in two variables with one solution or no solutions. **Interaction:** The student uses a tool that plots points and draws lines through points to graph systems of linear equations.
Allowable Stimulus Materials:	Linear equations, solutions of linear equations, systems of linear equations (a single brace may be used to indicate a system), solutions of systems of linear equations, graphs of systems of linear equations, real-world scenarios that can be modeled by systems of linear equations, mathematical scenarios that can be modeled by systems of linear equations, or some combination of these
Allowable Disciplinary Vocabulary:	Linear equation, *y*-intercept, slope, standard form, intersection, system, solution, coefficient, constant, estimate, ordered pair, *x*-

	coordinate, *y*-coordinate
Allowable Tools:	Calculator, graphing software
Target-Specific Attributes	Equations must be linear with rational coefficients.
Key Nontargeted Constructs:	
Accessibility Concerns:	Reading load on questions that involve real-world or mathematical contexts may be heavy.
Sample Items:	MAT.08.SR.1.000EE.D.201, MAT.08.SR.1.000EE.D.204, MAT.08.TE.1.000EE.D.147

*SR = selected-response item; CR = constructed-response item; TE = technology-enhanced item; ER = extended-response item; PT = performance task