

# NWEA Assessment Item Illustrating 8.EE.C.8.b

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**Domain:** Expressions and Equations

**8.EE.C:** Analyze and solve linear equations and pairs of simultaneous linear equations.

**Calculator Availability:** No

How many solutions does each system have? Choose "No solution," "Exactly one solution," or "Infinitely many solutions" for each system.

System	Number of Solutions		
$\begin{cases} y = 3x + 2 \\ y = 3x + 4 \end{cases}$	No solution	Exactly one solution	Infinitely many solutions
$\begin{cases} 2x + y = 1 \\ 6x + 3y = 3 \end{cases}$	No solution	Exactly one solution	Infinitely many solutions
$\begin{cases} 2x - y = 5 \\ 2x + y = 5 \end{cases}$	No solution	Exactly one solution	Infinitely many solutions

**Alignment: 8.EE.C.8b:** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example,  $3x + 2y = 5$  and  $3x + 2y = 6$  have no solution because  $3x + 2y$  cannot simultaneously be 5 and 6.*

In this item, each system is purposely designed so that analysis of their structure should prompt students to select the number of solutions quickly if they have an understanding of the concepts articulated in the cluster 8.EE.C. Not only should students be able to understand when systems have zero, one, or infinitely many solutions, they also should understand what that means in terms of the structure of the system.

**Coherence:** The standards in cluster 8.EE.C build on the grade 7 fluency standard for solving equations of the form  $px + q = r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers.<sup>7.EE.A.4</sup> As students become familiar with deriving, creating, and solving systems of equations—in both mathematical and real-world contexts—they are building the foundational skills to understand and work with systems of inequalities<sup>HSA-CED.A.3</sup> and to work with more complex systems in high school courses.<sup>HSA-REI.C</sup>

**Rigor:** This item attends to conceptual understanding. Students demonstrate conceptual understanding when examining each system of equations, hopefully by inspection, to determine the number of solutions. The variety of systems highlights what it means for systems to have zero, one, or infinitely many solutions.

**Answer Key:**

How many solutions does each system have? Choose "No solution," "Exactly one solution," or "Infinitely many solutions" for each system.

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