

System of two variable equations

A **system of linear equations** is a pair of equations considered together, each in the form $ax + by = c$. A **solution to the system** is the ordered pair (x, y) that satisfies both equations at once graphically, the point where the two lines intersect. The SAT tests three solving methods and the reasoning behind how many solutions a system has.

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What the question is really asking



System of equations

Two or more equations grouped together, solved simultaneously



Solution to a system

The ordered pair (x, y) that makes every equation in the system true.



Consistent system

A system with at least one solution. The lines meet.



Inconsistent system

A system with no solution, the lines are parallel and never meet.



Independent system

A consistent system with exactly one solution, distinct intersecting lines.



Dependent system

A consistent system with infinitely many solutions.



SAT tip

Three solving methods work for every system: **substitution**, **elimination**, and **graphing**. Choosing the right one for the setup given saves real time on the test.

2 System of Equations

Consider system of equation

$$a_1x + b_1y + c_1 = 0 \text{ \& \; } a_2x + b_2y = c_2 = 0$$

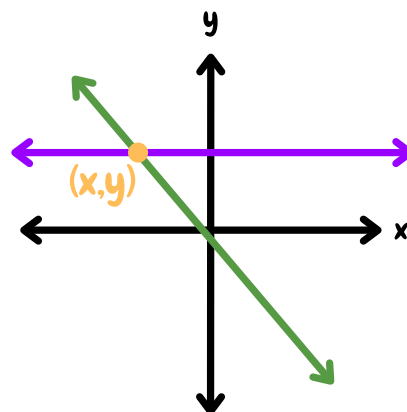
1st condition

$$a_1 / a_2 \neq b_1 / b_2$$

**Algebraic
Interpretation**

Exactly **one solution** (unique)
consistent & independent system

**Graphical
Representation**



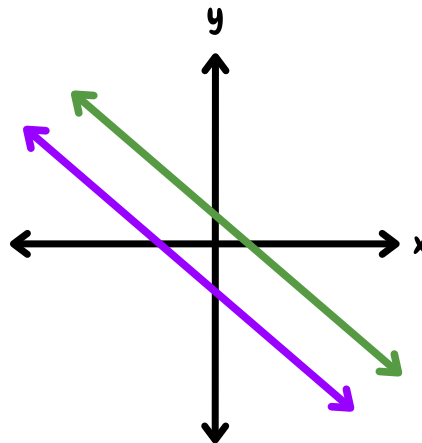
2nd condition

$$a_1 / a_2 = b_1 / b_2 \neq c_1 / c_2$$

Algebraic Interpretation

No solution, Inconsistent system

Graphical Representation



3rd condition

$$a_1 / a_2 = b_1 / b_2 = c_1 / c_2$$

Algebraic Interpretation

infinite solution, **consistent & dependent** system

Graphical Representation

