Section 4.1 Solving Systems of Linear Equations by Graphing

Complete the outline as you view Video Lecture 4.1. Pause the video as needed to fill in the blanks. Then press Play to continue. Also, circle your answer to each numbered exercise.

Objective 1 Determine if an ordered pair is a solution of a system of equations in two variables

A system of linear equations consists of two or more linear equations.

A _________ of a system consists of an ordered pair that satisfies all equations of the system.

Determine if the given ordered pair is a solution of the following system of equations.

\[
\begin{align*}
3x - y &= 5 \\
x + 2y &= 11
\end{align*}
\]

Work with me.

1. Is (3, 4) a solution?
2. Is (0, -5) a solution?

Pause and work.

Play and check.

Objective 2 Solve a system of linear equations by graphing

To solve systems by graphing, look for points in common to the graphs of all equations.
Solve the system of equation by graphing.

Work with me.

3. \[
\begin{align*}
2x + y &= 0 \\
3x + y &= 1
\end{align*}
\]

Intersecting lines have one point in common—the system has __________ ________.

If equations have different graphs: __________
If a system has at least one solution: __________
Solve the system of equations by graphing.

Pause and work.

4. \[
\begin{align*}
x + y &= 5 \\
x + y &= 6
\end{align*}
\]

Play and check.

**Parallel lines:** No point in common—system has \( \underline{\text{_____} \quad \underline{_____}} \).

If two lines have the same slope, but different \( y \)-intercepts, the lines are \( \underline{\text{_____}} \).

No solution: inconsistent systems

Equations with different graphs: independent equations.
Solve the system of equations by graphing.

**Work with me.**

\[
\begin{align*}
6x - y &= 4 \\
\frac{1}{2} y &= -2 + 3x
\end{align*}
\]

5. \[\begin{align*}
6x - y &= 4 \\
\frac{1}{2} y &= -2 + 3x
\end{align*}\]

**Equations with the same graph:** dependent equations

**At least one solution:** consistent systems

**Review of graphing a system of equations**

- **One point of intersection:** Consistent System Independent Equations
- **Parallel lines:** Inconsistent system Independent Equations
- **Same line:** Consistent System Dependent Equations
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**Objective 3**  Without graphing, determine the number of solutions of a system

Determine the number of solutions for each system of equations.

**Work with me.**

6. \[
\begin{align*}
4x + y &= 24 \\
x + 2y &= 2
\end{align*}
\]

**Work with me.**

7. \[
\begin{align*}
x + y &= 4 \\
x + y &= 3
\end{align*}
\]

**Pause and work.**

8. \[
\begin{align*}
6y + 4x &= 6 \\
3y + 3 &= -2x
\end{align*}
\]

**Play and check.**