**7.6 – Properties of the systems of linear equations**

A system of two linear equations with two variables can have 0, 1 or an infinite amount of solutions.



 The slopes are different same slope but different same slope and same *y*-intercepts *y-*intercepts

 $\rightarrow 1 solution$ $\rightarrow no solution \rightarrow an infinity of solutions$

Consequences*:* If we only want to know the number of solutions of a system, we need to write the two equations in their slope-intercept forms.

Examples:

1. $\left\{\begin{array}{c}2x+y=8\\4x+2y=16\end{array}\right. $ b) $\left\{\begin{array}{c}3x+y=9\\6x+2y=12\end{array}\right.$ c) $\left\{\begin{array}{c}x+y=8\\-5x+y=1\end{array}\right.$

$ \rightarrow an infinity of solutions \rightarrow no solutions \rightarrow 1 solution$

Remark: What happens if we try to solve without finding the number of solutions?

1. $\left\{\begin{array}{c}2x+y=8\\4x+2y=16\end{array}\right.$ b) $\left\{\begin{array}{c}3x+y=9\\6x+2y=12\end{array}\right.$ c) $\left\{\begin{array}{c}x+y=8\\-5x+y=1\end{array}\right.$

  

 (always true) (never true )

 $\rightarrow $infinity of solutions ­­$\rightarrow $ no solution ­­$\rightarrow $1 solution

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