# Systems of Linear Inequalities in Two Variables

Finite Math

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# Quiz

Describe the dumbest conversation you have overheard recently.

# Solving Systems of Linear Inequalities Graphically

**Definition (Solution Region/Feasible Region)**

*Given a system of inequalities, the solution region or feasible region consists of all points* $(x, y)$ *which simultaneously satisfy all of the inequalities in the system.*

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## Example

*Solve the following system of linear inequalities graphically:*

$$\begin{array}{rcrcl} 3x & + & y & \leq & 21 \\ x & - & 2y & \leq & 0 \end{array}$$

# Now You Try It!

**Example**

*Solve the following system of linear inequalities graphically:*

$$\begin{array}{rcrcl} 3x & + & y & \geq & 6 \\ x & - & 5y & \leq & 5 \end{array}$$

# Corner Points

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## Example

*Solve the following system of linear inequalities graphically and find the corner points:*

$$\begin{array}{rcrcl} x & + & y & \leq & 10 \\ 5x & + & 3y & \geq & 15 \\ -2x & + & 3y & \leq & 15 \\ 2x & - & 5y & \leq & 6 \end{array}$$

# Now You Try It!

## Example

*Solve the following system of linear inequalities graphically and find the corner points:*

$$\begin{array}{rcrcl} 5x & + & y & \geq & 20 \\ x & + & y & \geq & 12 \\ x & + & 3y & \geq & 18 \\ & & x & \geq & 0 \\ & & y & \geq & 0 \end{array}$$

# Bounded and Unbounded Regions

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**Question**

*Which of the regions in examples 1-4 are bounded? Which are unbounded?*