Graphing Calculator Investigation

Systems of Linear Inequalities

You can graph systems of linear inequalities with a TI-83 Plus calculator using the Y= menu. You can choose different graphing styles to shade above or below a line.

Example **Graph the system of inequalities in the standard viewing window.**

$y \geq -2x + 3$
$y \leq x + 5$

Step 1

- Enter $-2x + 3$ as Y1. Since y is greater than $-2x + 3$, shade above the line.

  KEYSTROKES: -2 [X,T,θ,n] [+] 3

- Use the left arrow key to move your cursor as far left as possible. Highlight the graph style icon. Press [ENTER] until the shade above icon, ▜, appears.

Step 2

- Enter $x + 5$ as Y2. Since y is less than $x + 5$, shade below the line.

  KEYSTROKES: [X,T,θ,n] [+] 5

- Use the arrow and [ENTER] keys to choose the shade below icon, ▙.

Step 3

- Display the graphs by pressing [GRAPH].

  Notice the shading pattern above the line $y = -2x + 3$ and the shading pattern below the line $y = x + 5$. The intersection of the graphs is the region where the patterns overlap. This region includes all the points that satisfy the system $y \geq -2x + 3$ and $y \leq x + 5$.

$y = -2x + 3$
$y = x + 5$
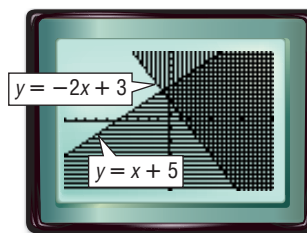
[−10, 10] scl: 1 by [−10, 10] scl: 1

Exercises

Solve each system of inequalities. Sketch each graph on a sheet of paper.

1. $y \geq 4$
$y \leq -x$

2. $y \geq -2x$
$y \leq -3$

3. $y \geq 1 - x$
$y \leq x + 5$

4. $y \geq x + 2$
$y \leq -2x - 1$

5. $3y \geq 6x - 15$
$2y \leq -x + 3$

6. $y + 3x \geq 6$
$y - 2x \leq 9$

7. $6y + 4x \geq 12$
$5y - 3x \leq -10$

8. $\frac{1}{4}y - x \geq -2$
$\frac{1}{3}y + 2x \leq 4$

www.algebra2.com/other_calculator_keystrokes

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