3.3 – Graph Systems of Linear Inequalities

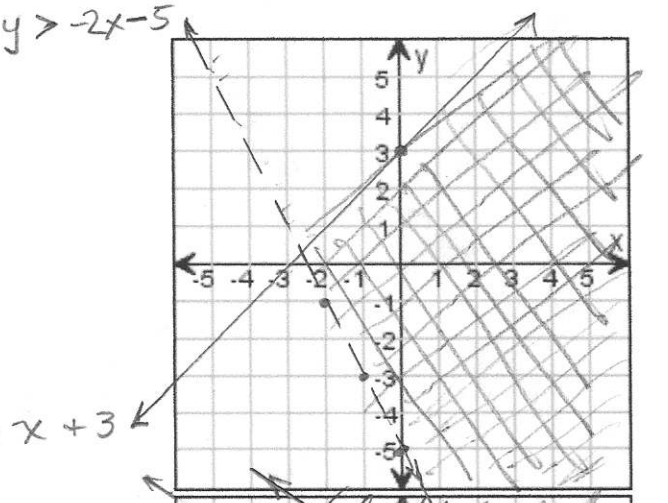
To graph a system of linear inequalities, follow these steps:

Step 1	Graph each inequality in the system. You may want to use colored pencils to distinguish the different half-planes
Step 2	Identify the region that is common to all the graphs of the inequalities. This region is the graph of the system. If you used colored pencils, the graph of the system is the region that has been shaded with every color.

Example 1 Graph the system of inequalities

$y > -2x - 5$

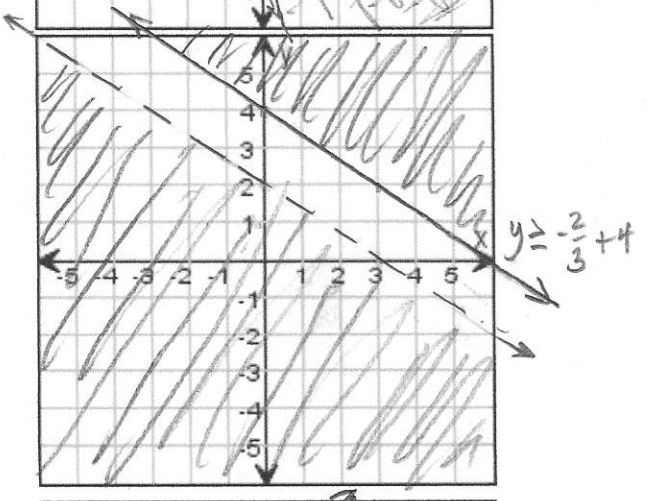
$y \leq x + 3$



Example 2 Graph the system of inequalities

$2x + 3y < 6$

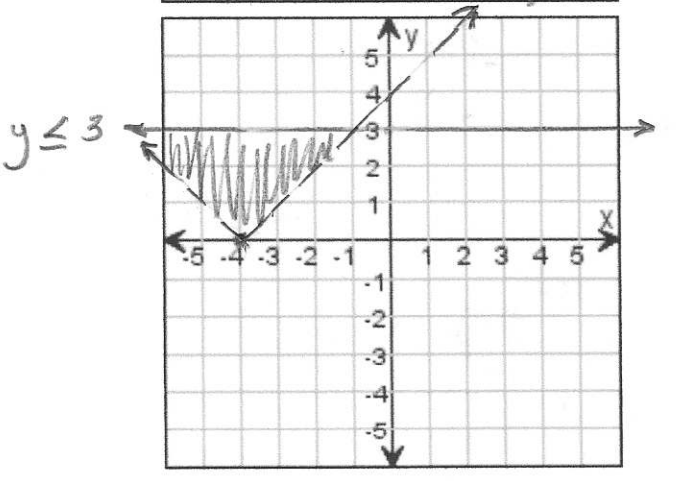
$y \geq -\frac{2}{3}x + 4$



Example 3 Graph the system of inequalities

$y \leq 3$

$y > |x + 4|$



HW: 2-18 even

EXAMPLES 1, 2, and 3
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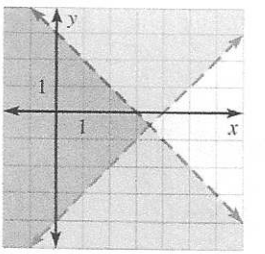
Exs. 3–16

3. ★ **MULTIPLE CHOICE** Which system of inequalities is represented by the graph?



Ⓐ $x + y > 3$
$-x + y < -4$

Ⓑ $-x + y \geq -4$
$x + y \leq 3$

Ⓒ $-2x + y > -4$
$2x + y < 3$

Ⓓ $-x + y > -4$
$x + y < 3$

SYSTEMS OF TWO INEQUALITIES **Graph the system of inequalities.**

4. $x > -1$
$x < 3$

5. $x \leq 2$
$y \leq 5$

6. $y \geq 5$
$y \leq 1$

7. $-x + y < -3$
$-x + y > 4$

8. $y < 10$
$y > |x|$

9. $4x - 4y \geq -16$
$-x + 2y \geq -4$

10. $-x \geq y$
$-x + y \geq -5$

11. $y > |x| - 4$
$3y < -2x + 9$

12. $x + y \geq -3$
$-6x + 4y < 14$

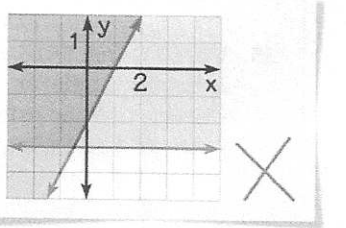
13. $2y < -5x - 10$
$5x + 2y > -2$

14. $3x - y > 12$
$-x + 8y > -4$

15. $x - 4y \leq -10$
$y \leq 3|x - 1|$

16. **ERROR ANALYSIS** *Describe* and correct the error in graphing the system of inequalities.

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



EXAMPLE 4
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Exs. 17–25

SYSTEMS OF THREE OR MORE INEQUALITIES **Graph the system of inequalities.**

17. $x < 6$
$y > -1$
$y < x$

18. $x \geq -8$
$y \leq -1$
$y < -2x - 4$

19. $3x + 2y > -6$
$-5x + 2y > -2$
$y < 5$