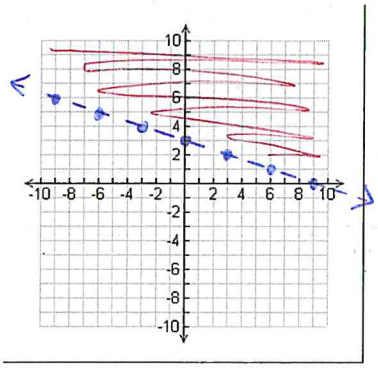
Graphing Linear Inequalities

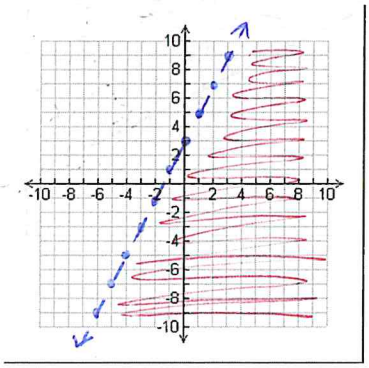
Unit 4: Systems

Sketch the graph of each of the following Linear Inequalities:

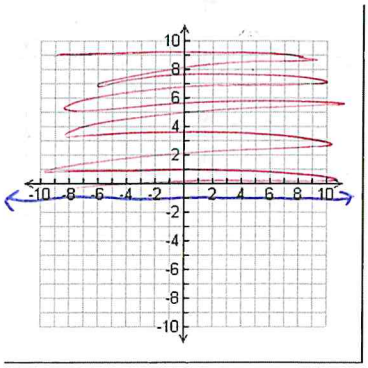
1. $x + 3y > 9$



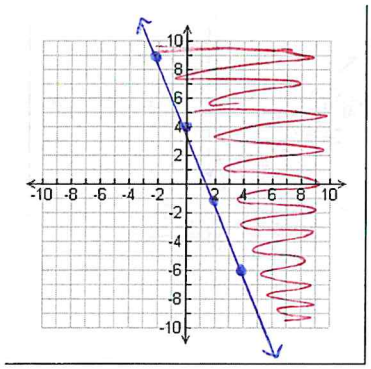
2. $2x - y > -3$



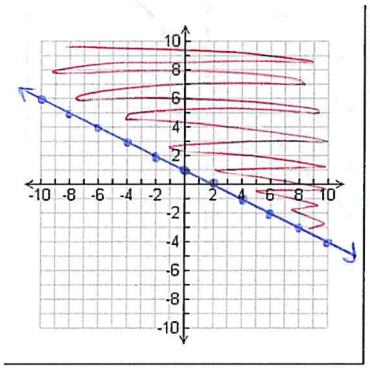
3. $y \geq -1$



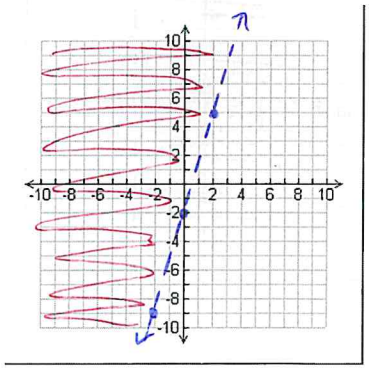
4. $5x + 2y \geq 8$



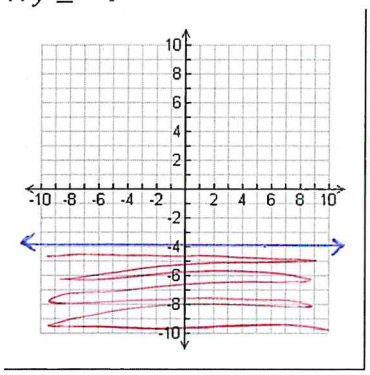
5. $x + 2y \geq 2$



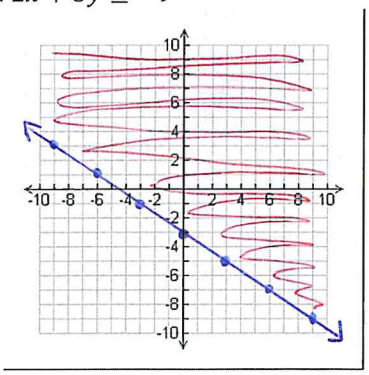
6. $7x - 2y < 4$



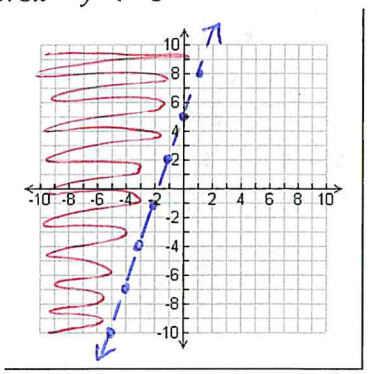
7. $y \leq -4$



8. $2x + 3y \geq -9$

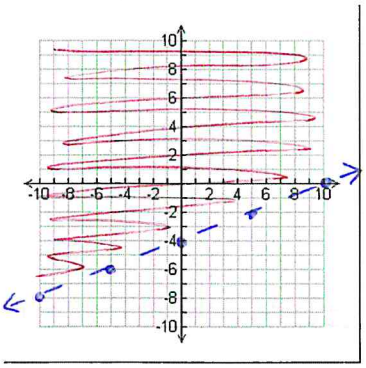


9. $3x - y < -5$

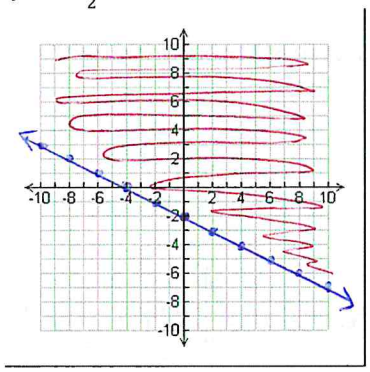


Sketch the graph of each of the following Linear Inequalities:

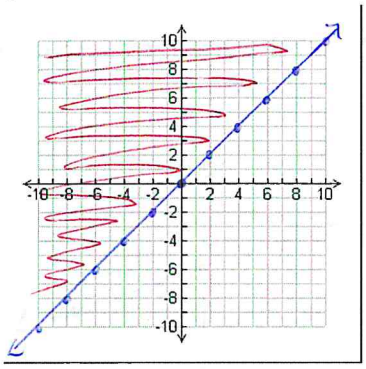
10. $2x - 5y < 20$



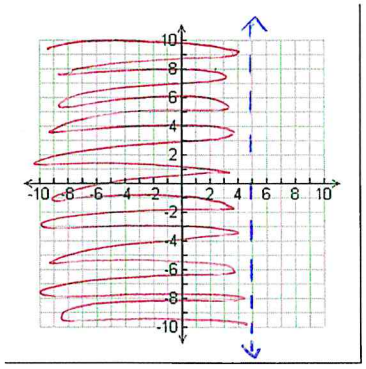
11. $y \geq -\frac{1}{2}x - 2$



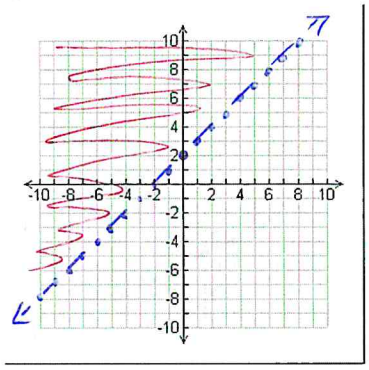
12. $y \geq x$



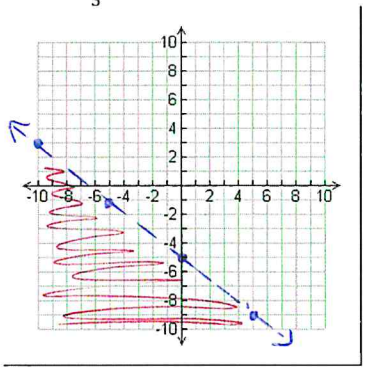
13. $x < 5$



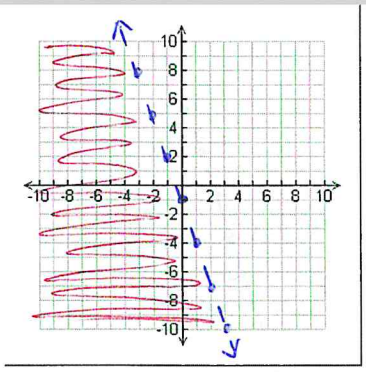
14. $y > x + 2$



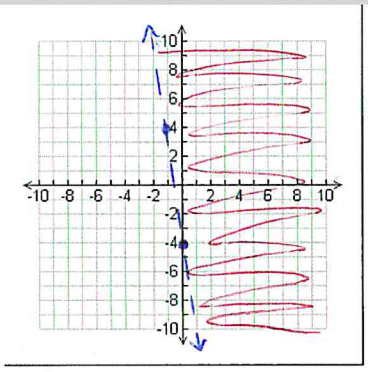
15. $y < -\frac{4}{5}x - 5$



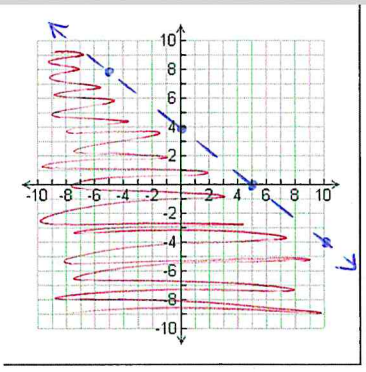
16. $y < -3x - 1$



17. $y > -8x - 4$



18. $y < -\frac{4}{5}x + 4$



① $x + 3y > 9$

$-x \qquad -x$

$\frac{3y}{3} > \frac{-x}{3} + \frac{9}{3}$

$y > -\frac{1}{3}x + 3$

- $m = \frac{-1}{3}$ = down 1, right 3
- y-intercept = 3
- $>$ means above the dashed line

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② $2x - y > -3$

$-2x \qquad -2x$

$\frac{-y}{-1} > \frac{-2x}{-1} - \frac{3}{-1}$

$y < 2x + 3$

- $m = 2$ OR $\frac{2}{1}$ = up 2, right 1
- y-intercept = 3
- $<$ means below the dashed line

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③ $y \geq -1$

- Special case since no x.
- y is always -1 so horizontal line at $y = -1$
- $\geq$ means above the solid line

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④ $5x + 2y \geq 8$

$-5x \qquad -5x$

$\frac{2y}{2} \geq \frac{-5x}{2} + \frac{8}{2}$

$y \geq -\frac{5}{2}x + 4$

- $m = \frac{-5}{2}$ = down 5, right 2
- y-intercept = 4
- $\geq$ means above the solid line

⑤ $x + 2y \geq 2$

$-x \qquad -x$

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

$y \geq -\frac{1}{2}x + 1$

- $m = \frac{-1}{2}$ = down 1, right 2
- y-intercept = 1
- $\geq$ means above the solid line

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⑥ $7x - 2y < 4$

$-7x \qquad -7x$

$\frac{-2y}{-2} < \frac{-7x}{-2} + \frac{4}{-2}$

$y > \frac{7}{2}x - 2$

- $m = \frac{7}{2}$ = up 7, right 2
- y-intercept = -2
- $>$ means above the dashed line

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⑦ $y \leq -4$

- Special case since no x.
- y is always -4 so a horizontal line at $y = -4$
- $\leq$ means below the solid line

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⑧ $2x + 3y \geq -9$

$-2x \qquad -2x$

$\frac{3y}{3} \geq \frac{-2x}{3} - \frac{9}{3}$

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

- $m = \frac{-2}{3}$ = down 2, right 3
- y-intercept = -3
- $\geq$ means above the solid line

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⑨ $3x - y < -5$

$-3x \qquad -3x$

$\frac{-y}{-1} < \frac{-3x}{-1} - \frac{5}{-1}$

$y > 3x + 5$

- $m = 3$ or $\frac{3}{1}$ = 3 up, right 1
- y-intercept = 5
- $>$ means above the dashed li
  line

(10) $2x - 5y < 20$

$-2x \quad -2x$

$\frac{-5y}{-5} < \frac{-2x}{-5} + \frac{20}{-5}$

$y > \frac{2}{5}x - 4$

- $m = \frac{2}{5}$ = Up 2, Right 5
- y-intercept = -4
- $>$ means above the dashed line

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(11) $y \geq -\frac{1}{2}x - 2$

- $m = -\frac{1}{2}$ = down 1, right 2
- y-intercept = -2
- $\geq$ means above the solid line

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(12) $y \geq x$

- $m = 1$ or $\frac{1}{1}$ = up 1, right 1
- y-intercept = 0
- $\geq$ means above the solid line

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(13) $x < 5$

- Special case since no y.
- x is always 5
- $<$ means below the dashed line

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(14) $y > x + 2$

- $m = 1$ or $\frac{1}{1}$ = up 1, right 1
- y-intercept = 2
- $>$ means above the dashed line

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(15) $y < \frac{-4}{5}x - 5$

- $m = \frac{-4}{5}$ = down 4, right 5
- y-intercept = -5
- $<$ means below the dashed line

(16) $y < -3x - 1$

- $m = -3$ or $\frac{-3}{1}$ = down 3, right 1
- y-intercept = -1
- $<$ means below the dashed line

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(17) $y > -8x - 4$

- $m = -8$ or $\frac{-8}{1}$ = down 8, right 1
  OR
  up 8, left 1
- y-intercept = -4
- $>$ means above the dashed line

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(18) $y < -\frac{4}{5}x + 4$

- $m = \frac{-4}{5}$ = down 4, right 5
- y-intercept = 4
- $<$ means below the dashed line.