

A #33

p. 409-410 #15-18, 23-24, 37-38, 44

Key

15. $x + 5y < 15$

a. $(-1, -3)$

$-1 + 5(-3) < 15$

$-1 + (-15) < 15$

$-16 < 15$

True \rightarrow Solution

b. $(-1, 3)$

$-1 + 5(3) < 15$

$-1 + 15 < 15$

$14 < 15$

True \rightarrow Solution

c. $(1, 3)$

$1 + 5(3) < 15$

$1 + 15 < 15$

$16 < 15$

* False \rightarrow Not a solution

d. $(3, 2)$

$3 + 5(2) < 15$

$3 + 10 < 15$

$13 < 15$

True \rightarrow solution

16. From Graph: y -int $(0, -1)$
 $m = -1$

Equation of boundary line $\rightarrow y = -x + (-1)$
Standard Form $\rightarrow x + y = -1$

Solid Line $\rightarrow \geq$ or \leq

Use $(0, -2) \rightarrow 0 + (-2) \square -1$
 $-2 \leq -1$

Answer: $x + y \leq -1$ **A**

17. $y > x + 3$

$>$ means dotted line

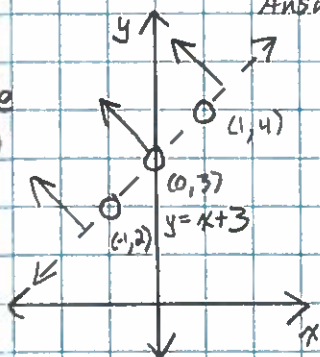
$m = 1$ y -int $(0, 3)$

check $(0, 0) \ 0 > 0 + 3$

$0 > 3$ False

check $(0, 4) \ 4 > 0 + 3$

$4 > 3$ True, shade above!



18. $y \leq x - 2$

\leq means solid line

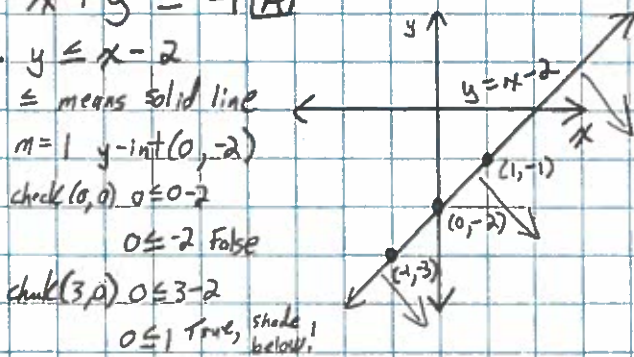
$m = 1$ y -int $(0, -2)$

check $(0, 0) \ 0 \leq 0 - 2$

$0 \leq -2$ False

check $(3, 0) \ 0 \leq 3 - 2$

$0 \leq 1$ True, shade below!



23. $x + 8y \geq 16$

\geq means solid line

x -int: $y = 0 \ x = 16 \ (16, 0)$

y -int: $x = 0 \ 8y = 16$

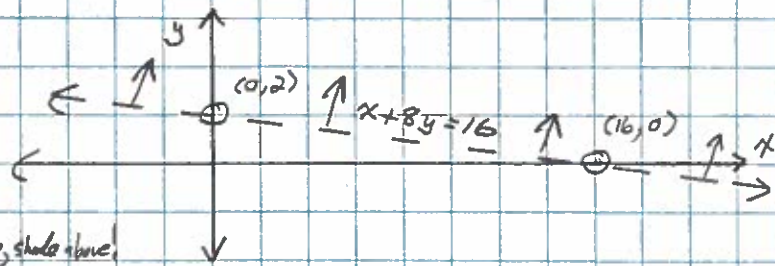
$y = 2 \ (0, 2)$

check $(0, 0) \ 0 + 0 \geq 16$

$0 \geq 16$ False

check $(0, 3) \ 0 + 24 \geq 16$

$24 \geq 16$ True, shade above!



24. $5x - y \geq 1$

\geq means solid line

$5x - y = 1$

$-y = -5x + 1$

$y = 5x + (-1)$

$m = 5$ y -int $(0, -1)$

check $(0, 0)$

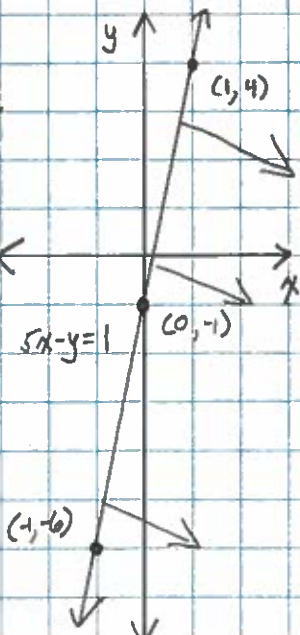
$0 - 0 \geq 1$

$0 \geq 1$ False

check $(1, 0)$

$5 - 0 \geq 1$

$5 \geq 1$ True, shade below!



37. $2y - x \geq 2$

\geq means solid line \checkmark

x -int: $y = 0 \ -x = 2$

$x = -2 \ (-2, 0) \checkmark$

check $(0, 0) \ 0 - 0 \geq 2$

$0 \geq 2$ False

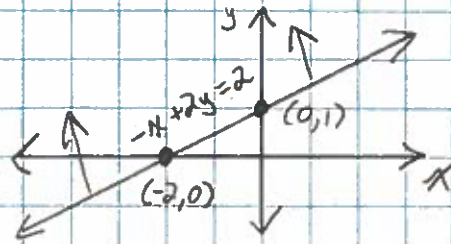
* Error \rightarrow The wrong half-plane is shaded.

y -int: $x = 0 \ 2y = 2$

$y = 1 \ (0, 1) \checkmark$

check $(0, 2) \ 4 - 0 \geq 2$

$4 \geq 2$ True, shade above!



A #33 continued

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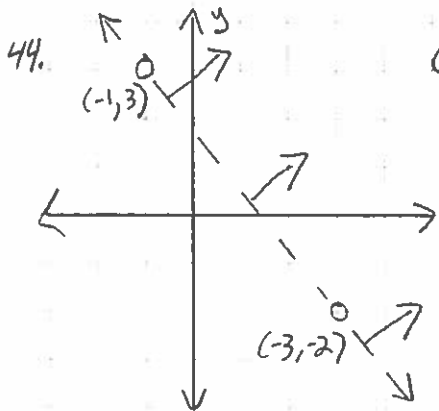
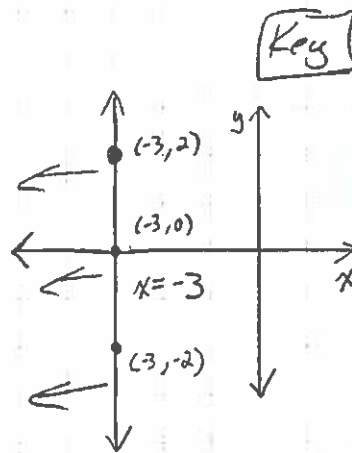
38. $x \leq -3$

\geq means solid line

* Error \rightarrow The line should be solid.

check $(0,0)$ $0 \leq -3$ False

check $(-4,0)$ $-4 \leq -3$ True, shade left \checkmark



① Boundary Line

$$m = \frac{\Delta y}{\Delta x} = \frac{-5}{4}$$

$$m = -\frac{5}{4} \quad (-1, 3)$$

$$y = mx + b$$

$$3 = -\frac{5}{4}(-1) + b$$

$$\frac{13}{4} = \frac{5}{4} + b$$

$$b = \frac{7}{4}$$

$$y = -\frac{5}{4}x + \frac{7}{4}$$

② Determine the Inequality

Dotted line $\rightarrow >$ or $<$

use $(1, 1)$ $1 \square -\frac{5}{4}(1) + \frac{7}{4}$

$$1 \square -\frac{5}{4} + \frac{7}{4}$$

$$1 \square \frac{1}{2}$$

$$y > -\frac{5}{4}x + \frac{7}{4}$$