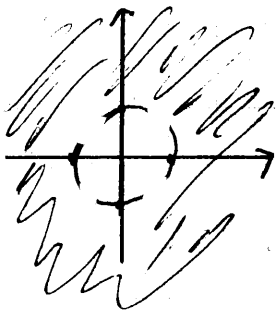
Check (0,0): $0 \geq 6$ False $0 \leq 2$ True

p. 832-834
9, 12, 18, 21, 28, 30, 36, 39, 45, 49, 51

12.8

4.) $x^2 + y^2 > 1$



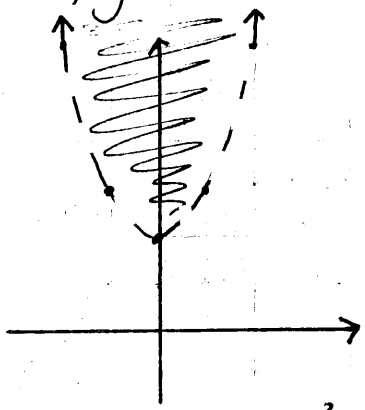
Point Inside: $0^2 + 0^2 > 1$

$1 > 1$ FALSE

Point Outside $2^2 + 2^2 > 1$

$8 > 1$ True

12.) $y > x^2 + 2$



Point Inside: $3 > 0^2 + 2$ (0,3)

$3 > 2$ True

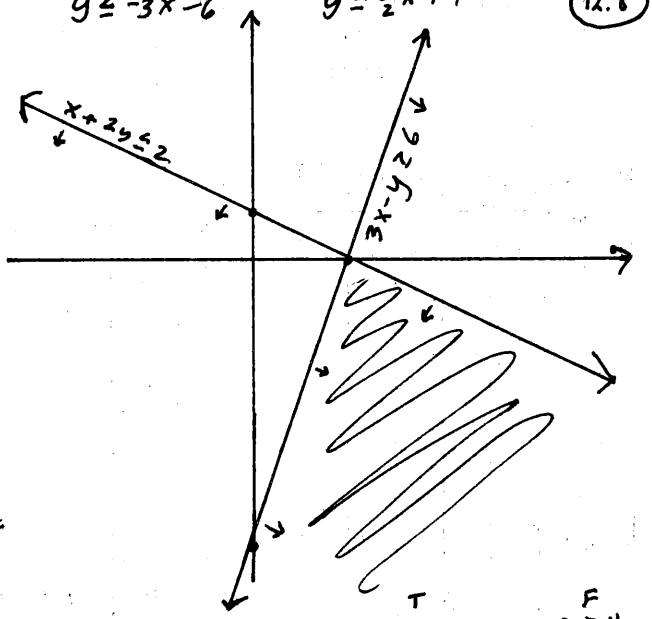
Point Outside $0 > 0^2 + 2$ (0,0)

$0 > 2$ FALSE

18.) $3x - y \geq 6$ $x + 2y \leq 2$

(2,0) (0,-6) (2,0) (0,1)

$y \leq -3x - 6$ $y \leq \frac{1}{2}x + 1$



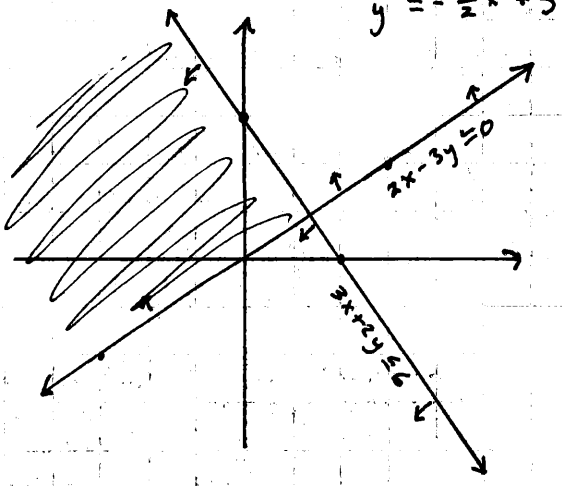
T $0 \leq 8$ F $0 \geq 4$

21.) $2x - 3y \leq 0$ $3x + 2y \leq 6$

$-3y \leq -2x$ (0,3) (2,0)

$y \geq \frac{2}{3}x$ or $2y \leq -3x + 6$

$y \leq -\frac{3}{2}x + 3$

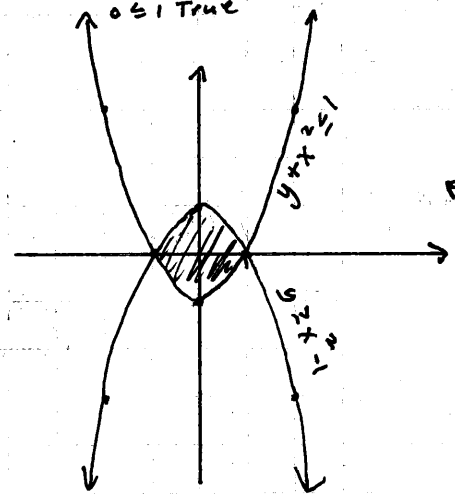


28.) $y + x^2 \leq 1$ $y \geq x^2 - 1$

$y \leq -x^2 + 1$ $0 \geq 0^2 - 1$

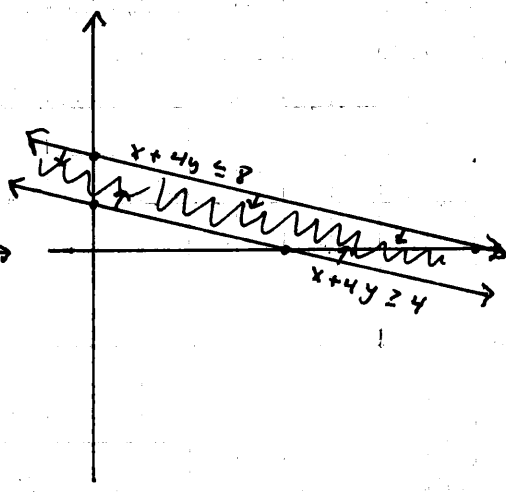
$0 \leq -0^2 + 1$ $0 \geq -1$ True

$0 \leq 1$ True



30.) $x + 4y \leq 8$ $x + 4y \geq 4$

(0,2) (8,0) (0,1) (4,0)

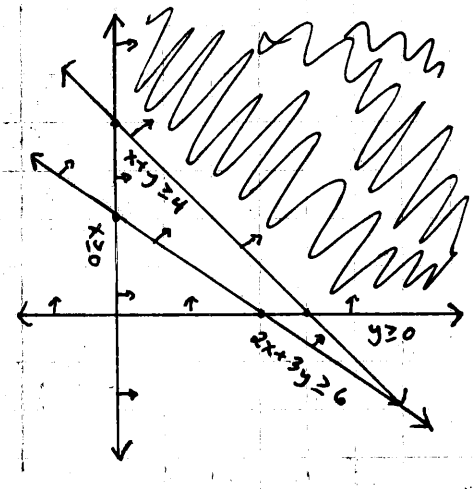


36a) $x \geq 0$ $y \geq 0$

$x + y \geq 4$ $2x + 3y \geq 6$

(0,4) (4,0) (0,2) (3,0)

$0 \geq 4$ FALSE $0 \geq 6$ FALSE



UNBOUNDED

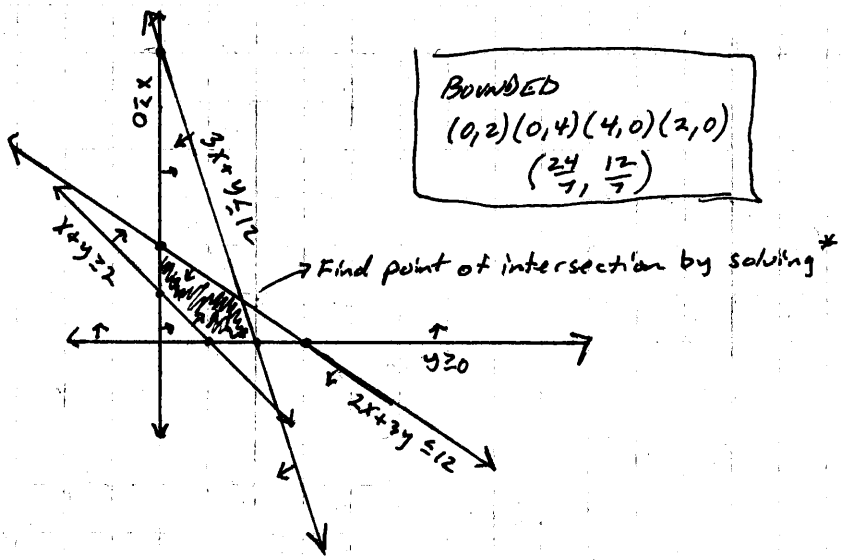
(0,4) (4,0)

39.) $x \geq 0 \quad y \geq 0$

$x + y \geq 2$ (2,0) (0,2) → $0 \geq 2$ FALSE

$2x + 3y \leq 12$ (6,0) (0,4) → $0 \leq 12$ TRUE

$3x + y \leq 12$ (4,0) (0,12) → $0 \leq 12$ TRUE



BOUNDED
(0,2) (0,4) (4,0) (2,0)
$\left(\frac{24}{7}, \frac{12}{7}\right)$

→ Find point of intersection by solving *

* $3x + y = 12 \rightarrow y = 12 - 3x$
$2x + 3y = 12$
$2x + 3(12 - 3x) = 12$
$2x + 36 - 9x = 12$
$-7x = -24$
$x = \frac{24}{7}$

$y = 12 - 3\left(\frac{24}{7}\right)$
$= 12 - \frac{72}{7}$
$= \frac{84}{7} - \frac{72}{7}$
$y = \frac{12}{7}$

45.) $x \geq 0 \quad y \geq 0 \quad x \leq 4$

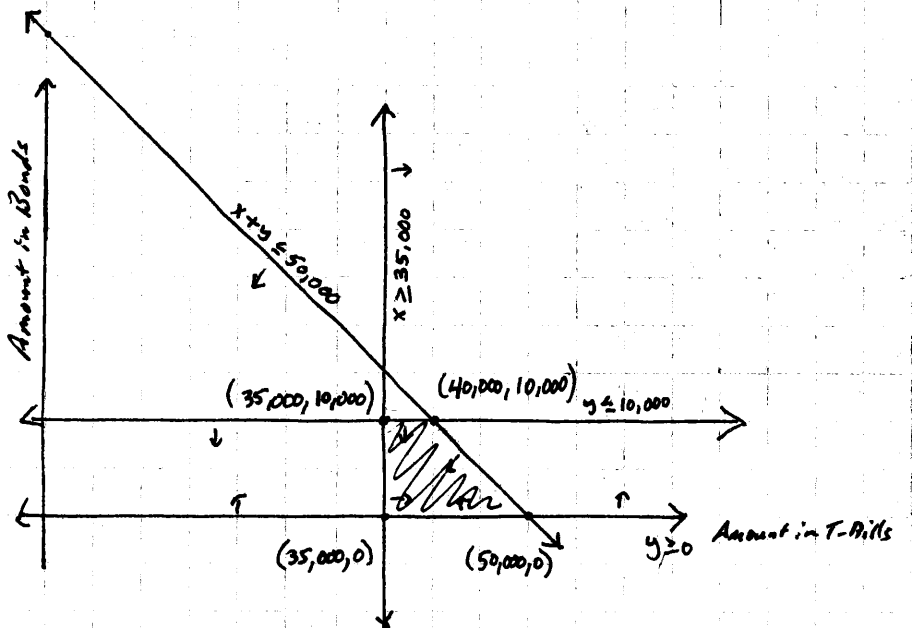
and → $y \leq -x + 6$

y-int of 6
Slope of $\frac{6-2}{0-4} = \frac{4}{-4} = -1$

51.) 75 lbs* Grade A and 120 lbs* of Grade B coffee avail.
blended into 1 lb packages:
economy blend: 4 oz* Grade A 12 oz* of B
Superior blend: 8 oz* Grade A 8 oz* Grade B

49.) $50,000 to invest At least $35,000 in T-Bills at 7%
At most $10,000 in corporate bonds yielding 10%
x = amount in T-bills y = amount in bonds

a.) $x \geq 35,000 \quad y \geq 0 \quad x + y \leq 50,000 \quad y \leq 10,000$
↳ overrides $x \geq 0$



a.) x = # of packages economy blend
y = # of packages of Superior blend

$x \geq 0 \quad y \geq 0$

$4\left(\frac{1}{4}x + \frac{1}{2}y \leq 75\right)$ ← amount of Grade A (lbs)

$4\left(\frac{3}{4}x + \frac{1}{2}y \leq 120\right)$ ← Amount of Grade B (lbs)

CLEAR FRACTIONS!

$x + 2y \leq 300$ (0,150) (300,0)
$3x + 2y \leq 480$ (0,240) (160,0)

$x + 2y = 300$
$-3x - 2y = -480$
$-2x = -180$
$x = 90$

$90 + 2y = 300$
$2y = 210$
$y = 105$

(90, 105)