

Set OBJFV = 100

Chapter 3. LP Graphic Solutions

1. Example (Ragsdale Page 41, Problem 10 with modification):

Obj.: M?? $50X + 40Y$

To draw OBJF S.t.

Set $x=0, y=2.5, (0, 2.5)$ $1X + 2Y \leq 6$ (1)

$y=0, x=2, (2, 0)$ $5X + 3Y \leq 15$ (2)

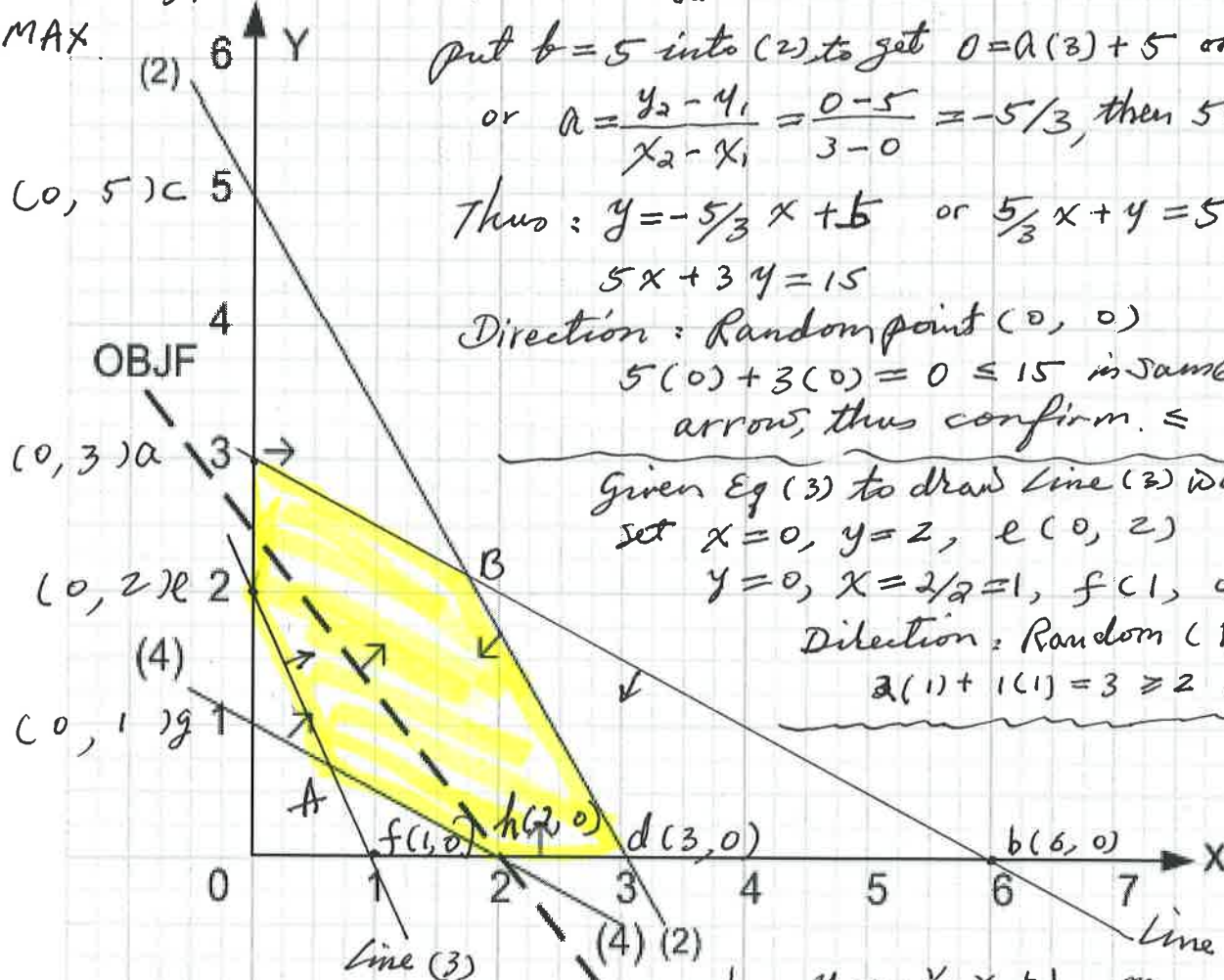
Direction: $2X + 1Y \geq 2$ (3)

Random 2 points, $x, y \geq 0$ (5)

$(0, 0)$: OBJFV = 0

$(1, 1)$: OBJFV = $50 + 40 = 90$

So: MAX



Given Line (4) to find Eqn (4): OBJF

Random 2 points on Line (4)

$g(0, 1)$ and $h(2, 0)$

$y = ax + b$ (0)

$y_1 = ax_1 + b$ or $1 = a(0) + b$ (1)

So $b = 1, y_2 = ax_2 + b$ or $0 = a(2) + b$ (2)

So, $0 = 2a + 1, a = -1/2$

Put $a = -1/2$, and $b = 1$ into (0)

Given eq(1) to draw Line (1) with Direct

Set $x=0, y=6/2=3, a(0, 3)$

$y=0, x=6, b(6, 0)$

Line (1) direction: Random point $(0, 0)$

$0 + 2(0) = 0 \leq 6$ confirm

Given Line (2) with direction to find Eq(2)

Random 2 points on Line (2)

$c(0, 5)$ and $d(3, 0)$

$y = ax + b$ (0)

$y_1 = ax_1 + b$ or $5 = a(0) + b$ (1) $b = 5$

$y_2 = ax_2 + b$ or $0 = a(3) + b$ (2)

Put $b = 5$ into (2) to get $0 = a(3) + 5$ or $a = -5/3$

or $a = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 5}{3 - 0} = -5/3$, then $5 = a(0) + b$

Thus: $y = -5/3 x + 5$ or $5/3 x + y = 5$

$5X + 3Y = 15$

Direction: Random point $(0, 0)$

$5(0) + 3(0) = 0 \leq 15$ in same side of arrow, thus confirm. $\leq$

Given Eq (3) to draw Line (3) with direction

Set $x=0, y=2, e(0, 2)$

$y=0, x=2/2=1, f(1, 0)$

Direction: Random $(1, 1)$

$2(1) + 1(1) = 3 \geq 2$ confirm

$y = -1/2 x + 1$ or

$1/2 x + y = 1$ or $x + 2y = 2$

Direction: Random $(1, 1)$ Same side of arrow.

$1 + 2(1) = 3 \geq 2$ confirm

draw $x \geq 0$ and $y \geq 0$

Feasible Region: $A-B-C-D-A$