$2x+3y \leq 6$

$x-y \leq 1$

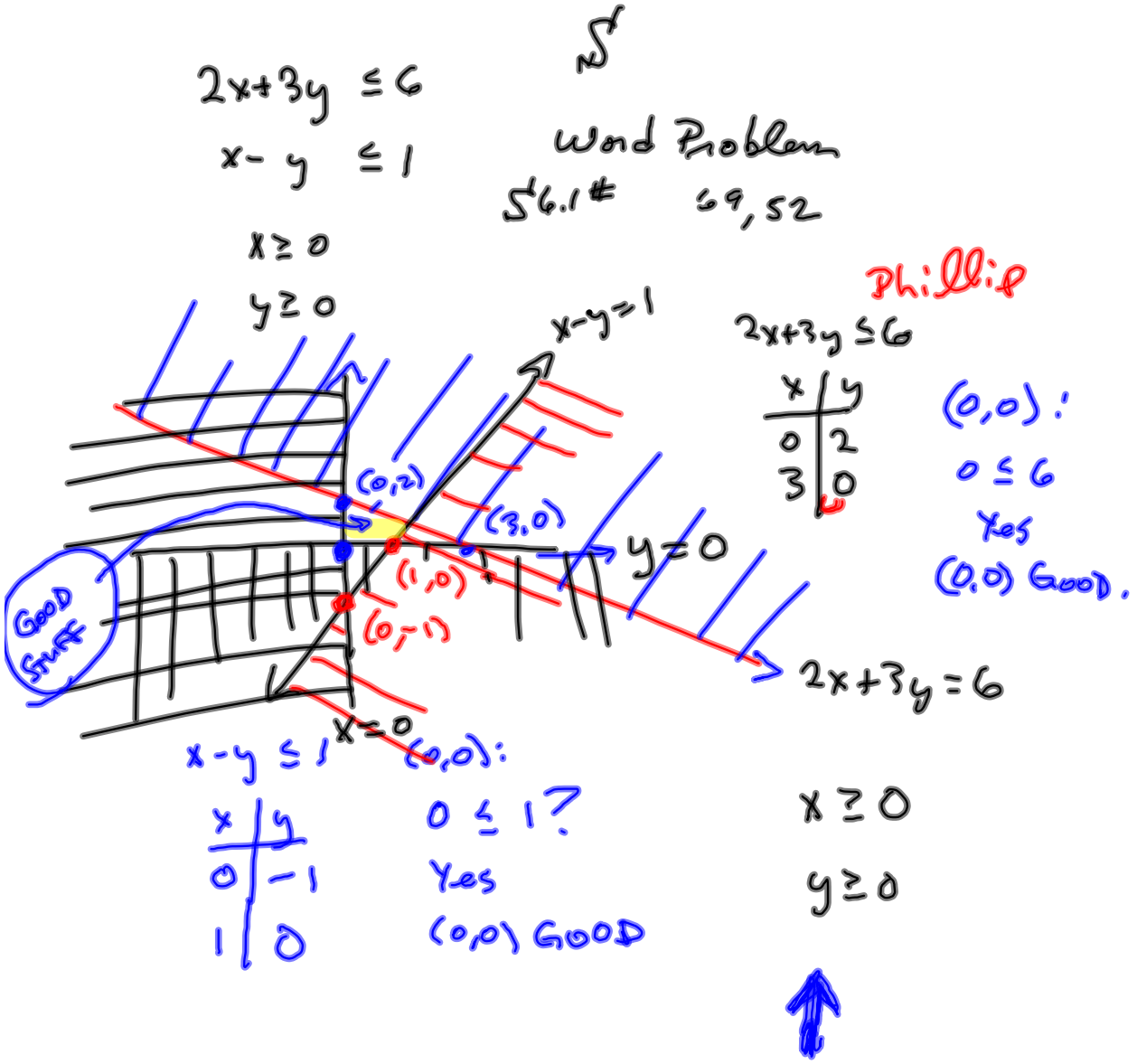
$x \geq 0$

$y \geq 0$

Word Problem

56.1 # 69, 52

Phillip



(52)

$$\begin{aligned} 3x - y &= 4 \\ x + y - z &= -1 \\ x + 2z &= 3 \end{aligned} \longrightarrow \left[\begin{array}{ccc|c} 3 & -1 & 0 & 4 \\ 1 & 1 & -1 & -1 \\ 1 & 0 & 2 & 3 \end{array}\right]$$

$$\left[\begin{array}{ccc|c} 1 & 0 & 2 & 3 \\ 1 & 1 & -1 & -1 \\ 3 & -1 & 0 & 4 \end{array}\right]$$

$$\begin{matrix} \\ -R1+R2 \\ -3R1+R3 \end{matrix}\left[\begin{array}{ccc|c} 1 & 0 & 2 & 3 \\ 0 & 1 & -3 & -4 \\ 0 & -1 & -6 & -5 \end{array}\right] R2+R3 \left[\begin{array}{ccc|c} 1 & 0 & 2 & 3 \\ 0 & 1 & -3 & -4 \\ 0 & 0 & -9 & -9 \end{array}\right]$$

$$-\tfrac{1}{9}R3 \left[\begin{array}{ccc|c} 1 & 0 & 2 & 3 \\ 0 & 1 & -3 & -4 \\ 0 & 0 & 1 & 1 \end{array}\right] \begin{matrix} -2R3+R1 \\ 3R3+R2 \end{matrix} \left[\begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & 1 \end{array}\right]$$

$$\Rightarrow (x, y, z) \in \{(1, -1, 1)\}$$

Dependent 3x3 for bonus on test.
Look @ example from 11/15 notes

10/11/15

$$\begin{bmatrix} A \\ B \\ C \end{bmatrix} = \begin{bmatrix} D \\ E \\ F \end{bmatrix} \iff \begin{matrix} A=D \\ B=E \\ C=F \end{matrix}$$

(57)

$$\begin{aligned} x + y + z &= 8 \\ x - y - z &= -7 \\ x - y + z &= 2 \end{aligned}$$

$$\left[\begin{array}{ccc|c} 1 & 1 & 1 & 8 \\ 1 & -1 & -1 & -7 \\ 1 & -1 & 1 & 2 \end{array}\right] \begin{matrix} \\ -R1+R2 \\ -R1+R3 \end{matrix} \left[\begin{array}{ccc|c} 1 & 1 & 1 & 8 \\ 0 & -2 & -2 & -15 \\ 0 & -2 & 0 & -6 \end{array}\right]$$

$$\begin{matrix} R1 \\ -\frac{1}{2}R3 \\ R2 \end{matrix} \left[\begin{array}{ccc|c} 1 & 1 & 1 & 8 \\ 0 & 1 & 0 & 3 \\ 0 & -2 & -2 & -15 \end{array}\right] \begin{matrix} -R2+R1 \\ R2 \\ 2R2+R3 \end{matrix} \left[\begin{array}{ccc|c} 1 & 0 & 1 & 5 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & -2 & -9 \end{array}\right]$$

$$\begin{matrix} \\ -\frac{1}{2}R3 \end{matrix} \left[\begin{array}{ccc|c} 1 & 0 & 1 & 5 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & \frac{9}{2} \end{matrix}\right] \begin{matrix} -R3+R1 \end{matrix} \left[\begin{array}{ccc|c} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & \frac{9}{2} \end{matrix}\right]$$

$$\left\{\left(\tfrac{1}{2}, 3, \tfrac{9}{2}\right)\right\}$$

$$\{(.5, 3, 4.5)\}$$

§5.2 #27

(27)

$$x + 2y - 3z = -17$$
$$3x - 2y - z = -3$$

Do it with a C6 flavor:

$$\left[\begin{array}{ccc|c} 1 & 2 & -3 & -17 \\ 3 & -2 & -1 & -3 \end{array}\right]$$

$-3R1+R2$

$$\left[\begin{array}{ccc|c} 1 & 2 & -3 & -17 \\ 0 & -8 & 8 & 48 \end{array}\right]$$

$-\frac{1}{8}R2$

$$\left[\begin{array}{ccc|c} 1 & 2 & -3 & -17 \\ 0 & 1 & -1 & -6 \end{array}\right]$$

$-2R2+R1$

$$\left[\begin{array}{ccc|c} 1 & 0 & -1 & -5 \\ 0 & 1 & -1 & -6 \end{array}\right]$$

$$x - z = -5$$
$$y - z = -6$$

$$x = z - 5$$
$$y = z - 6$$

$$\{(z-5, z-6, z) \mid z \text{ is real}\}$$

Dependent.

§6.1 #69

$40,000 total

$3600 total return

Let x = the amt invested in MF (in thousands of $)

y = " " " " T-Bills

z = " " " " MB

$$x + y + z = 40$$

$$.08x + .09y + .12z = 3.66$$

Total investment in T-Bills & MB is equal to MF

$$y + z = x \Rightarrow x - y - z = 0$$

The matrix:

$$\left[\begin{array}{ccc|c} 1 & 1 & 1 & 40 \\ 8 & 9 & 12 & 366 \\ 1 & -1 & -1 & 0 \end{array}\right]$$

Word prob(s) on test will be about Setup:

variables
system
matrix

§5.3

(45) $y = 2^x$

$x = \log_4(y) \Rightarrow 4^x = y$

$4^x = 2^x$

$(2^2)^x = 2^x$

$2^{2x} = 2^x$

$2x = x$

$x = 0 \Rightarrow y = 1$

$\ln(4^x) = \ln(2^x)$

$x\ln(4) = x\ln(2)$

$x\ln(4) - x\ln(2) = 0$

$x(\ln(4) - \ln(2)) = 0$

$x\ln\left(\frac{4}{2}\right) = 0$

$\frac{x\ln(2)}{\ln(2)} = \frac{0}{\ln(2)}$

$x = 0$