#17

$$6x \quad - 5z = 17$$
$$-1(5x - y + 3z = -1)$$
$$2x + y \quad = -41$$

Left-to-right, top-to-bottom helps ME keep things straight.

My mean trick for this one was seeing I could get 1x in the top left by subtracting E2 from E1:

$$\begin{array}{lrrrl} E1 & 6x & & -5z & = 17 \\ -E2 & -5x & +y & -3z & = 1 \\ \hline E1-E2: & x & +y & -8z & = 18 \end{array}$$

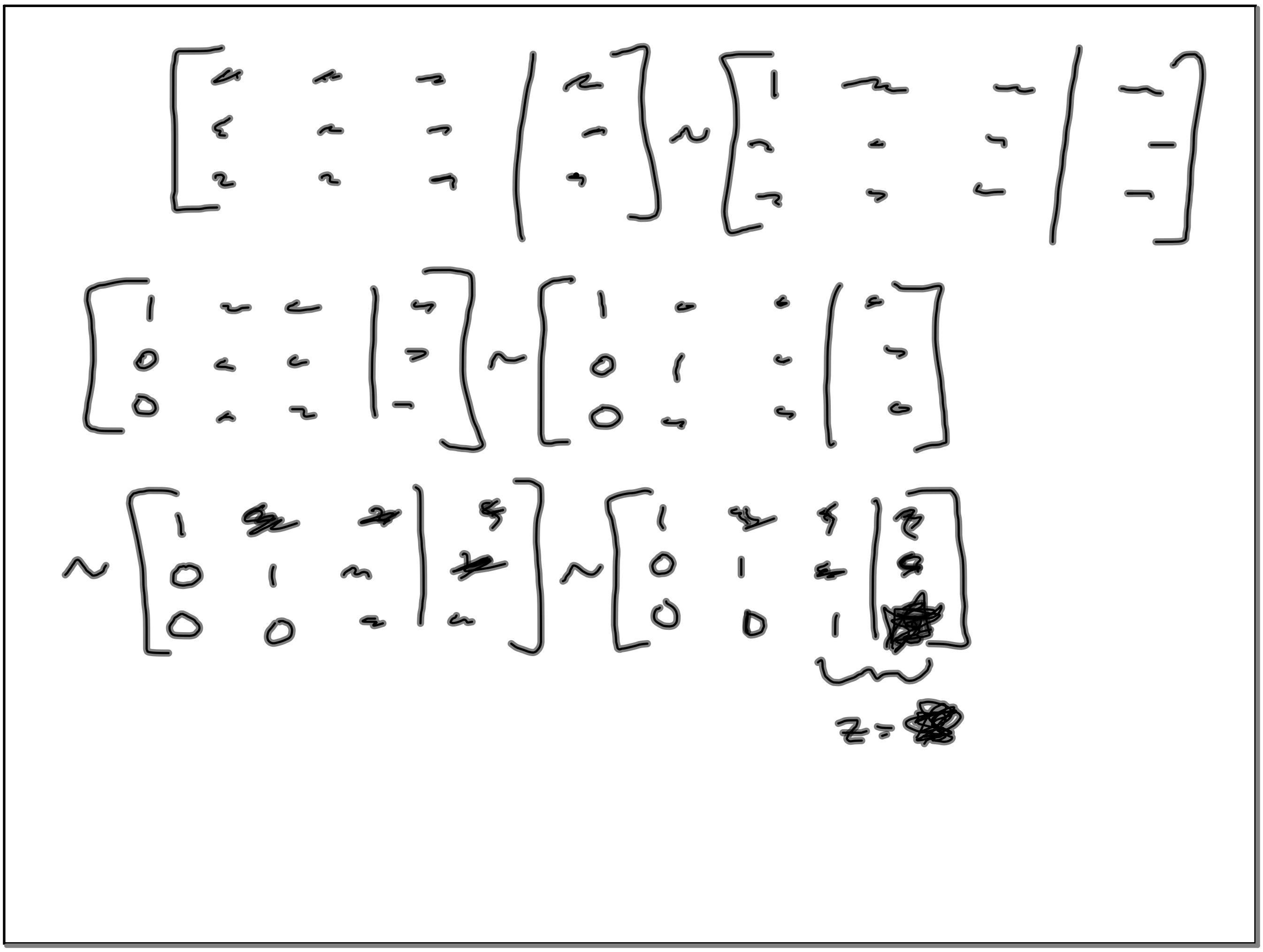
New System:

$$\begin{array}{lrrrl} E1 & x & + y & - 8z & = 18 \\ E2 & 5x & - y & + 3z & = -1 \\ E3 & 2x & + y & & = -41 \end{array}$$

Recipe:
E1
$-5E1 + E2$
$-2E1 + E3$

$-5E1 \quad -5(x + y - 8z = 18)$

$$\begin{array}{lrl} -5E1 & -5x - 5y + 40z & = -90 \\ E2 & 5x - y + 3z & = -1 \\ \hline -5E1 + E2 & -6y + 43z & = -91 \end{array}$$



§4.3 #s 1, 6, 8, 12, 20, 23, 37, 38 → Setup only

$D = rt$

	Distance	Rate	Time
upstream	D	$r - c$	26.5 hrs
downstream	D	$r + c$	17 hrs

Let r = his rowing speed in still water $\left(\frac{km}{hr}\right)$

c = the speed of the current $\left(\frac{km}{hr}\right)$

$c = r - 6.8$ → Nice for substitution

$D = D$

$(r-c)(26.5) = (r+c)(17)$

$26.5r - 26.5c = 17r + 17c$

$9.5r - 43.5c = 0$

TIMES 10

$95r - 435c = 0$

$95r - 435c = 0$

$c = r - 6.8$

Rm 110 @ 2pm Wed

Rm 143 @ 1pm Thursday

11. Karen Karlin bought some large frames for \$15 each and some small frames for \$8 each at a closeout sale. If she bought 22 frames for \$239, find how many of each type she bought.

Let x = the # of large frames
& y = " " " small frames

She bought 22 frames

$x + y = 22 \longrightarrow$ # frames = # frames

The total cost was \$239

$15x + 8y = \underline{239}$ → \$

$\left(\frac{15 \ \$}{1 \ \cancel{\text{large frame}}}\right)\left(x \ \cancel{\text{large frames}}\right) = 15x \ \$$ Good.

\$ = \$

Setup
$$x + y = 22$$
$$15x + 8y = 239$$

Sep 29-9:29 AM

14. Twice a first number plus a second number is 42, and the first number minus the second number is −6. Find the numbers.

Let $x = 1^{\text{st}}$ #

$y = 2^{\text{nd}}$ #

$$2x + y = 42$$
$$x - y = -6$$

19. A Piper airplane and a B737 aircraft cross each other (at different altitudes) traveling in opposite directions. The B737 travels 5 times the speed of the Piper. If in 4 hours, they are 2160 miles apart, find the speed of each aircraft.

$D = rt$

Let x = the speed of the Piper $\left(\frac{\text{miles}}{\text{hr}}\right)$

y = " " " " B737 "

	Distance	Rate	Time
Piper	$4y$	y	4
B737	$4x$	x	4
TOTAL	$4x+4y$	$x+y$	

Might help
Might not.

$\boxed{4x + 4y = 2160} \rightarrow x + y = 540$

B737 is 5 times faster than the Piper.

$\boxed{y = 5x}$

$x + y = 540$ → Solve by substitution.

$y = 5x$

37. Rabbits in a lab are to be kept on a strict daily diet that includes 30 grams of protein, 16 grams of fat, and 24 grams of carbohydrates. The scientist has only three food mixes available with the following grams of nutrients per unit.

	Protein	*Fat*	*Carbohydrate*
Mix A	4	6	3
Mix B	6	1	2
Mix C	4	1	12

Find how many units of each mix are needed daily to meet each rabbit's dietary need.

Let x = the # of units of Mix A
y = " " " " " B
z = " " " " " C

$$4x + 6y + 4z = 30$$

$$\left(\frac{4 \text{ g protein}}{1 \cancel{\text{ unit Mix A}}}\right)(x \cancel{\text{ units Mix A}})$$

$$\boxed{\begin{aligned} 4x + 6y + 4z &= 30 \\ 6x + y + z &= 16 \\ 3x + 2y + 12z &= 24 \end{aligned}}$$

This is the setup.