

8.4 p. 531

$$\text{ex 4} \quad x + 3y - 6z = 7 \xrightarrow{\textcircled{1}} x + 3y - 6z = 7$$

$$2x - y + z = 1$$

$$x + 2y + 2z = -1 \xrightarrow{\textcircled{3}(-1)} -x - 2y - 2z = 1$$

$$\underline{\hspace{10em}} \\ y - 8z = 8$$

$$\textcircled{2} \rightarrow 2x - y + z = 1$$

$$\textcircled{3}(-2) \rightarrow -2x - 4y - 4z = 2$$

$$\underline{\hspace{10em}} \\ -5y - 3z = 3$$

$$x + 2y + 2z = -1$$

$$x + 2(0) + 2(-1) = -1$$

$$x + 0 - 2 = -1$$

$$\textcircled{x = 1}$$

$$y - 8z = 8 \xrightarrow{\textcircled{1}(-5)} 5y - 40z = 40$$

$$-5y - 3z = 3 \rightarrow -5y - 3z = 3$$

$$\underline{\hspace{10em}} \\ -43z = 43$$

$$y - 8z = 8$$

$$y - 8(-1) = 8$$

$$y + 8 = 8$$

$$\textcircled{y = 0}$$

$$\textcircled{z = -1}$$

$$(1, 0, -1)$$

$$2x + 2y - 2z = 6 \rightarrow 2x + 2(1) - 2(-1) = 6$$
$$y + z = 0 \rightarrow y + (-1) = 0 \downarrow$$
$$5z = -5$$
$$z = -1$$
$$y = 1$$
$$2x + 2 + 2 = 6$$
$$2x + 4 = 6$$
$$x = 1$$

$$(1, 1, -1)$$

ex 6

$$\begin{array}{r}
 -3x + y - z = -10 \xrightarrow{\textcircled{1}(3)} -9x + 3y - 3z = -30 \\
 -4x + 2y + 3z = -1 \xrightarrow{\textcircled{2}} -4x + 2y + 3z = -1 \\
 \hline
 2x + 3y - 2z = -5 \quad -13x + 5y \quad = -31 \\
 \quad \quad \quad \quad -40x - 5y \quad = -75 \\
 \hline
 \quad \quad \quad \quad -53x \quad = -106
 \end{array}$$

$\textcircled{1}(-2) \rightarrow 6x - 2y + 2z = 20$   
 $\textcircled{3} \rightarrow 2x + 3y - 2z = -5$   
 $\hline$   
 $8x + y = 15$

$2x + 3y - 2z = -5$   
 $2(2) + 3(-1) - 2z = -5$   
 $4 - 3 - 2z = -5$   
 $1 - 2z = -5$   
 $-2z = -6$   
 $\textcircled{z = 3}$

$8x + y = 15$   
 $8(2) + y = 15$   
 $16 + y = 15$   
 $\textcircled{y = -1}$

$(2, -1, 3)$

*mult. by -5*

ex 3.2

$$\begin{array}{r}
 -2x + 5y + z = -3 \\
 5x + 14y - 2z = -11 \\
 7x + 9y - 2z = -5
 \end{array}
 \left. \begin{array}{l} \\ \\ \end{array} \right\} \begin{array}{l}
 3x + 19y = -14 \\
 \cdot 2 \\
 -4x + 10y + 2z = -6 \\
 7x + 9y - 2z = -5 \\
 \hline
 3x + 19y = -11
 \end{array}$$

$\cdot (-1)$

$$\begin{array}{r}
 3x + 19y = -14 \\
 -3x - 19y = 11 \\
 \hline
 0 = -3
 \end{array}$$

no soln.

parallel

no solution

ex 34

$$\begin{array}{l} x + 4y - z = 3 \xrightarrow{\cdot 2} 2x + 8y - 2z = 6 \\ -2x - 8y + 2z = -6 \xrightarrow{\quad} \underline{-2x - 8y + 2z = -6} \\ 3x + 12y - 3z = 9 \qquad \qquad \qquad 0 = 0 \end{array}$$

$$\{(x, y, z) \mid x + 4y - z = 3\}$$

8.5 p. 541

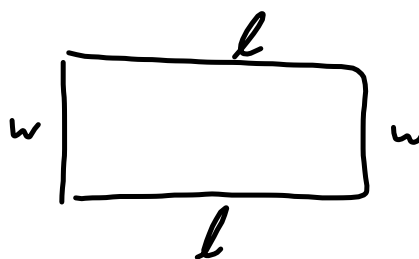
ex 4

 $w = \text{width}$  $l = \text{length}$ 

$$w = l - 44$$

$$w = 94 - 44$$

$$w = 50$$



$$w + l + w + l = 288$$

$$2w + 2l = 288$$

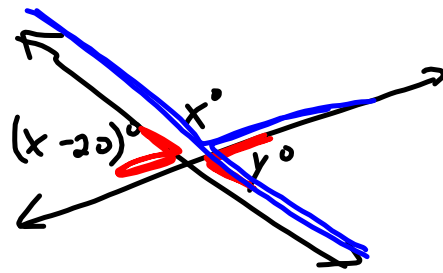
$$2(l - 44) + 2l = 288$$

$$2l - 88 + 2l = 288$$

$$4l = 376$$

$$l = 94$$

ex 8



$$y = x - 20$$

$$x + y = 180$$

$$x + x - 20 = 180$$

$$2x = 200$$

$$x = 100$$

$$y = x - 20$$

$$y = 100 - 20$$

$$y = 80$$

ex 14 \$5000 1yr  $I = prt$

a. 2%  $I = 5000(.02)(1) = \$100$

b. 3%  $I = 5000(.03)(1) = \$150$

c. 4%  $I = 5000(.04)(1) = \$200$

d. 3.5%  $I = 5000(.035)(1) = \$175$



Ex 18

$x = L$  of strong (33%) acid  
 $y = L$  of weak (15%) acid

Vol.

$$x + y = 120$$

use

$$.33x + .15y = (.21)(120)$$

to get %  
pure acid

$$33x + 15y = (21)(120)$$

$$(100)(.21)(120)$$

$$(21)(120)$$

mult.  
by -15

$$-15x - 15y = -1800$$

$$33x + 15y = 2520$$

$$18x$$

$$= 720$$

$$x = 40 L \text{ of } 33\% \text{ acid}$$

$$x + y = 120$$

$$40 + y = 120$$

$$y = 80 L \text{ of } 15\% \text{ acid}$$

$x$  L of weak<sup>15</sup> soln.  
are mixed with 50 L of strong<sup>33</sup> acid  
to get a 21% soln.

$$x + 50 = y - \text{vol}$$
$$15x + 33(50) = 21y - \%$$

ex 22  $x = L$  of 50% juice drink  
 $y = L$  " 30% " "

$$x + y = 200$$

$$50x + 30y = 45(200) \rightarrow 50x + 30y = 9000$$

$$5x + 3y = 900$$

$$-3x - 3y = -600$$

$$5x + 3y = 900$$

$$\begin{array}{r} 2x \qquad \qquad \qquad = 300 \end{array}$$

$x = 150 L$  of  
50% drink

$$x + y = 200$$

$$150 + y = 200$$

$y = 50 L$   
of 30% drink