p609 #53, 54, 59, 61, 65, 69, ~~72~~

p628 #25, 27, 30

p609

(53) $\begin{bmatrix} 3 & 4 \\ 5 & 3 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -2 \\ 4 \end{bmatrix}$ $\quad \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 2 \\ -2 \end{bmatrix}$ $\quad \boxed{\begin{matrix} x = 2 \\ y = -2 \end{matrix}}$

(54) $\begin{bmatrix} 18 & 12 \\ 30 & 24 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 13 \\ 23 \end{bmatrix}$ $\quad \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 1/2 \\ 1/3 \end{bmatrix}$ $\quad \boxed{\begin{matrix} x = 1/2 \\ y = 1/3 \end{matrix}}$

(59) $\begin{bmatrix} 4 & -1 & 1 \\ 2 & 2 & 3 \\ 5 & -2 & 6 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -5 \\ 10 \\ 1 \end{bmatrix}$ $\quad \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -1 \\ 3 \\ 2 \end{bmatrix}$ $\quad \boxed{\begin{matrix} x = -1 \\ y = 3 \\ z = 2 \end{matrix}}$

(61) $\begin{bmatrix} 5 & -3 & 2 \\ 2 & 2 & -3 \\ 1 & -1 & 8 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 2 \\ 3 \\ -4 \end{bmatrix}$ $\quad \begin{bmatrix} x \\ y \\ z \end{bmatrix} =$ No soln

(65) $\begin{bmatrix} 7 & -3 & 0 & 2 \\ -2 & 1 & 0 & -1 \\ 4 & 0 & 1 & -2 \\ -1 & 1 & 0 & -1 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \\ w \end{bmatrix} = \begin{bmatrix} 41 \\ -13 \\ 12 \\ -8 \end{bmatrix}$ $\quad \begin{bmatrix} x \\ y \\ z \\ w \end{bmatrix} = \begin{bmatrix} 5 \\ 0 \\ -2 \\ 3 \end{bmatrix}$ $(5, 0, -2, 3)$

(69)
$$\begin{bmatrix} 1 & 1 & 1 \\ .065 & .07 & .09 \\ 0 & 2 & -1 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 12000 \\ 835 \\ 0 \end{bmatrix} \quad \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{matrix} \$9,000 & AAA \\ \$1,000 & A \\ \$2,000 & B \end{matrix}$$

(72) (a) $3b + 27a = 561.2$

$27b + 251a = 5068$

$$\begin{bmatrix} 3 & 27 \\ 27 & 251 \end{bmatrix}\begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} 561.2 \\ 5068 \end{bmatrix} \quad \begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} 10063/60 \\ 93/20 \end{bmatrix}$$

(b) $y = 2.15t + 167.7$

(c) $y = 2.15(13) + 167.7 = 195.65$

(d) Close!

(e) $208 = 2.15(x) + 167.7$

$x = 2008$

p628

(25) $4 = \pm\frac{1}{2}\begin{vmatrix} -5 & 1 & 1 \\ 0 & 2 & 1 \\ -2 & y & 1 \end{vmatrix}$

$4 = \pm\frac{1}{2}\left[-5(2-y) - 1(0+2) + 1(0+2y)\right]$

$4 = \pm\frac{1}{2}(-10+5y-2+2y) = \pm\frac{1}{2}(5y-8)$

$8 = 5y - 8$ or $-8 = 5y - 8$

$16 = 5y$ $\quad$ $0 = 5y$

$\boxed{\frac{16}{5} = y}$ $\quad$ $\boxed{0 = y}$

(27) $6 = \pm\frac{1}{2}\begin{vmatrix} -2 & -3 & 1 \\ 1 & -1 & 1 \\ -8 & y & 1 \end{vmatrix}$

$6 = \pm\frac{1}{2}\left[-2(-1-y) + 3(1+8) + 1(y+8)\right]$

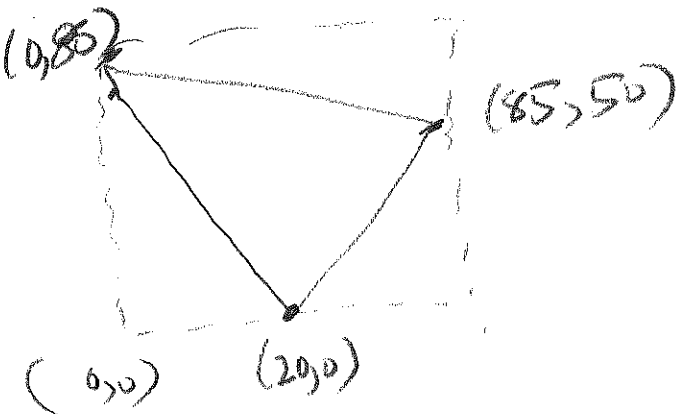
$6 = \pm\frac{1}{2}\left[2+2y+27+y-8\right]$

$6 = \pm\frac{1}{2}(3y+21)$

$12 = 3y + 21$ or $-12 = 3y + 21$

$\boxed{y = -3}$ or $\boxed{y = -11}$

(30)



$$A = \pm\frac{1}{2}\begin{vmatrix} 0 & 80 & 1 \\ 20 & 0 & 1 \\ 85 & 30 & 1 \end{vmatrix} = \pm\frac{1}{2}(6200) = \boxed{3{,}100\ ft^2}$$