P533

3, 4

89, 91, 92, 95, 96

3) $\begin{bmatrix} 1 & -1 & 1 \\ 2 & 0 & -3 \\ -1 & -1 & 2 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ -1 \\ -1 \end{bmatrix}$

$$\begin{bmatrix} 1 & -1 & 1 \\ 2 & 0 & -3 \\ -1 & -1 & 2 \end{bmatrix}^{-1} \begin{bmatrix} 0 \\ -1 \\ -1 \end{bmatrix} = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$$

$$\boxed{(1, 2, 1)}$$

4) $\begin{bmatrix} 2 & -1 & 0 \\ 1 & 3 & -1 \\ 0 & 3 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ -3 \\ 8 \end{bmatrix}$

$$\begin{bmatrix} 2 & -1 & 0 \\ 1 & 3 & -1 \\ 0 & 3 & 1 \end{bmatrix}^{-1} \begin{bmatrix} 0 \\ -3 \\ 8 \end{bmatrix} = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$$

$$\boxed{(5/13, 10/13, 74/13)}$$

89.) x = # of children riders
y = # of adult riders
z = # of senior riders

$$x + y + z = 1400$$
$$.25x + 1y + .75z = 740$$
$$x = y + z + 250$$

$$\begin{bmatrix} 1 & 1 & 1 \\ .25 & 1 & .75 \\ 1 & -1 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1400 \\ 740 \\ 250 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & 1 \\ .25 & 1 & .75 \\ 1 & -1 & -1 \end{bmatrix}^{-1} \begin{bmatrix} 1400 \\ 740 \\ 250 \end{bmatrix}$$

825 children riders, 410 adult riders and 165 senior riders.

91) x = amt in CD's 6.7%
y = amt in Bond 9.3%
z = amt in growth fund 15.6%

$$x + y + z = 80{,}000$$
$$.067x + .093y + .156z = 10{,}843$$
$$z = 3(x+y)$$
$$3x + 3y$$

$$\begin{bmatrix} 1 & 1 & 1 \\ .067 & .093 & .156 \\ -3 & -3 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 80{,}000 \\ 10{,}843 \\ 0 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & 1 \\ .067 & .093 & .156 \\ -3 & -3 & 1 \end{bmatrix}^{-1} \begin{bmatrix} 80{,}000 \\ 10{,}843 \\ 0 \end{bmatrix}$$

monica invested \$14,500 in CD's, \$5,500 in bonds and \$60,000 in growth fund

95.) N = # of nickels
D = # of dimes
Q = # of quarters

$N + D + Q = 74$

$.05N + .1D + .25Q = 8.85$

$N + Q = D + 4$

$$\begin{bmatrix} 1 & 1 & 1 \\ .05 & .1 & .25 \\ 1 & -1 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 74 \\ 8.85 \\ 4 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & 1 \\ .05 & .1 & .25 \\ 1 & -1 & 1 \end{bmatrix}^{-1} \begin{bmatrix} 74 \\ 8.85 \\ 4 \end{bmatrix} = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$$

Matthew has 22 nickels, 35 dimes and 17 quarters.

96) x = # of \$1
y = # of \$5
z = # of \$10

$x + y + z = 51$

$1x + 5y + 10z = 177$

$y = 3z$

$$\begin{bmatrix} 1 & 1 & 1 \\ 1 & 5 & 10 \\ 0 & 1 & -3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 51 \\ 177 \\ 0 \end{bmatrix}$$

Heather has 27 \$1 bills, 18 \$5 bills, and 6 \$10 bills