Linear Systems and Matrices Answers

1. a. $\begin{cases} A + B + C = 155{,}000 \\ A - 2B = 0 \\ A + B - C = 115{,}000 \end{cases}$; toy A: \$90,000, toy B: \$45,000, toy C: \$20,000

b. $\begin{cases} -a + b = 0.005 \\ -a + c = 0.015 \\ 90{,}000a + 45{,}000b + 20{,}000c = 10{,}212.50 \end{cases}$; toy A: 6.25%, toy B: 6.75%, toy C: 7.75%

2. a. Total value

Wholesale Retail

$$IP = \begin{bmatrix} 100 & 341 \\ 106.5 & 393 \end{bmatrix} \begin{matrix} \text{Store 1} \\ \text{Store 2} \end{matrix}$$

IP represents the total wholesale and total retail values of the action figures in Store 1 and in Store 2.

b. $2I = \begin{bmatrix} 28 & 20 & 0 & 6 & 4 \\ 26 & 32 & 10 & 2 & 0 \end{bmatrix}$

3. X = 50, Y = 35, Z = 80;

The price of Doll X is \$50, of Doll Y is \$35 and of Doll Z is \$80.

4. a. 175 mi^2

b. $2x + y - 45 = 0$

5. a. $A^{-1} = \begin{bmatrix} -24 & 18 & 5 \\ 20 & -15 & -4 \\ -5 & 4 & 1 \end{bmatrix}$; Lawrence Smith; Maisie Levinson

b. [44 88 137] [21 46 80] [14 53 142] [71 99 53] [137 179 56];

[83 115 58] [40 74 101] [40 71 92] [34 68 107] [13 27 44] [4 8 12]