

Matrices and Determinants Answers

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

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

$$2. \text{ a. } IP = \begin{matrix} \text{Total value} \\ \text{Wholesale} & \text{Retail} \\ \begin{bmatrix} 100 & 341 \\ 106.5 & 393 \end{bmatrix} \end{matrix} \begin{matrix} \text{Store 1} \\ \text{Store 2} \end{matrix}$$

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

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

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

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

$$4. \text{ a. } 175 \text{ mi}^2$$

$$\text{b. } 2x + y - 45 = 0$$

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

$$\text{b. } [44 \ 88 \ 137][21 \ 46 \ 80][14 \ 53 \ 142][71 \ 99 \ 53][137 \ 179 \ 56];$$

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