

Chp 6

1. $A+C$

$$\begin{bmatrix} 3 & 10 & -9 \\ 7 & 7 & 8 \end{bmatrix}$$

2. $A+D$

not possible

3. $3E+D$

$$\begin{bmatrix} 7 & -4 \\ -1 & 8 \end{bmatrix}$$

4. AB

$$\begin{bmatrix} 8+0-9 & 4+1+6 \\ 0+0+24 & 0+2-16 \end{bmatrix} = \begin{bmatrix} -1 & 11 \\ 24 & -14 \end{bmatrix}$$

5. AD

not possible

6. DA

$$\begin{bmatrix} 7 & 2 \\ -4 & 1 \end{bmatrix} \begin{bmatrix} 4 & 1 & -3 \\ 0 & 2 & 8 \end{bmatrix} = \begin{bmatrix} 28+0 & 7+4 & -21+16 \\ -16+0 & -4+2 & 12+8 \end{bmatrix} = \begin{bmatrix} 28 & 11 & -5 \\ -16 & -2 & 20 \end{bmatrix}$$

$$7. \begin{bmatrix} 2 & x \\ y & -1 \end{bmatrix} \cdot \begin{bmatrix} 5 \\ 3 \end{bmatrix} = \begin{bmatrix} 19 \\ 17 \end{bmatrix} \Rightarrow \begin{bmatrix} 10+3x \\ 5y-3 \end{bmatrix} = \begin{bmatrix} 19 \\ 17 \end{bmatrix} \quad \begin{array}{l} 10+3x=19 \\ 3x=9 \\ x=3 \end{array} \quad \begin{array}{l} 5y-3=17 \\ 5y=20 \\ y=4 \end{array}$$

$$8. \begin{bmatrix} 4 & 5 \\ -1 & a \end{bmatrix} \cdot \begin{bmatrix} -2 & 3 \\ b & 4 \end{bmatrix} = \begin{bmatrix} 12 & 32 \\ 2b & 21 \end{bmatrix} \Rightarrow \begin{bmatrix} -8+5b & 12+20 \\ 2+ab & -3+4a \end{bmatrix} = \begin{bmatrix} 12 & 32 \\ 2b & 21 \end{bmatrix}$$

$$\begin{array}{l} -8+5b=12 \\ 5b=20 \\ b=4 \end{array} \quad \begin{array}{l} -3+4a=21 \\ 4a=24 \\ a=6 \end{array} \quad \begin{array}{l} \text{check } 2+(4)(6) \\ = 24 \checkmark \end{array}$$

$$9. a. M = \begin{bmatrix} 3 & -4 \\ 2 & -5 \end{bmatrix} \quad \det = (3)(-5) - (2)(-4) = -15 + 8 = -7 \quad A^{-1} = \frac{1}{-7} \begin{bmatrix} -5 & 4 \\ -2 & 3 \end{bmatrix} = \begin{bmatrix} \frac{5}{7} & -\frac{4}{7} \\ \frac{2}{7} & -\frac{3}{7} \end{bmatrix}$$

$$b. N = \begin{bmatrix} 4 & 12 \\ -2 & -6 \end{bmatrix} \quad \det = -24 + 24 = 0 \\ \text{not possible}$$

$$10. \det = 134 \quad A^{-1} = \begin{bmatrix} -0.216 & 0.127 & -0.097 \\ -0.022 & 0.082 & 0.231 \\ 0.746 & 0.060 & -0.104 \end{bmatrix}$$

$$11. \begin{bmatrix} 2 & -3 \\ -3 & 5 \end{bmatrix} \cdot \begin{bmatrix} X \\ Y \end{bmatrix} = \begin{bmatrix} -1 \\ 3 \end{bmatrix}$$

$A \cdot X = B$
 $X = A^{-1}B$

$$\det A = 10 - 9 = 1 \quad A^{-1} = \frac{1}{1} \cdot \begin{bmatrix} 5 & 3 \\ 3 & 2 \end{bmatrix}$$

$$A^{-1}B = \begin{bmatrix} 5 & 3 \\ 3 & 2 \end{bmatrix} \begin{bmatrix} -1 \\ 3 \end{bmatrix} = \begin{bmatrix} -5 + 9 \\ -3 + 6 \end{bmatrix} = \begin{bmatrix} 4 \\ 3 \end{bmatrix} = \begin{bmatrix} X \\ Y \end{bmatrix} \quad \text{checked } \checkmark$$

$$12. \begin{bmatrix} 2 & -5 & +3 \\ 4 & 1 & -6 \\ -3 & 9 & -7 \end{bmatrix} \cdot \begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = \begin{bmatrix} 9 \\ 35 \\ -6 \end{bmatrix}$$

$A \quad X \quad B$
 $X = A^{-1}B$

$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = \begin{bmatrix} 1 \\ -5 \\ -6 \end{bmatrix}$$

$$13. a. \begin{cases} 12a + 4b = \$10.56 \\ 10a + 6b = \$8.88 \end{cases} \quad \begin{bmatrix} 12 & 4 \\ 10 & 6 \end{bmatrix} \begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} 10.56 \\ 8.88 \end{bmatrix} \Rightarrow \begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} .87 \\ .03 \end{bmatrix}$$

$A \quad X \quad B$
 $X = A^{-1}B$

\$.87 for apples
 \$.03 for Bananas

$$b. \underline{D = 4.05 \quad W = 3.20 \quad B = 8.50}$$

$$\begin{cases} D + W + B = 15 \\ 4.05D + 3.20W + 8.5B = 68.15 \\ 0 \quad W - B = +4 \end{cases}$$

$$B + 4 = W$$

$$\begin{bmatrix} 1 & 1 & 1 \\ 4.05 & 3.20 & 8.5 \\ 0 & W & -B \end{bmatrix} \begin{bmatrix} D \\ W \\ B \end{bmatrix} = \begin{bmatrix} 15 \\ 68.15 \\ +4 \end{bmatrix}$$

$A \quad X \quad B$
 $X = A^{-1}B$

$$\begin{bmatrix} D \\ W \\ B \end{bmatrix} = \begin{bmatrix} 5 \\ 7 \\ 3 \end{bmatrix}$$

sold
 5 cookie doughs
 7 Wrapping Papers
 and 3 Coupon Books

$$13c \quad S = \$2.45 \quad D = \$3.10 \quad T = \$3.75 \quad 5T = S$$

$$S - 5T = 0$$

$$S + D + T = 29$$

$$S + 0 - 5T = 0$$

$$2.45S + 3.10D + 3.75T = \$82.10$$

$$\begin{bmatrix} 1 & 1 & 1 \\ 1 & 0 & -5 \\ 2.45 & 3.10 & 3.75 \end{bmatrix} \cdot \begin{bmatrix} S \\ D \\ T \end{bmatrix} = \begin{bmatrix} 29 \\ 0 \\ 82.10 \end{bmatrix} \Rightarrow \begin{bmatrix} S \\ D \\ T \end{bmatrix} = \begin{bmatrix} 15 \\ 11 \\ 3 \end{bmatrix}$$

she sold
15 singles
11 doubles
and 3 triples.

$A \quad X \quad B$
 $X = A^{-1}B$

$$14. \quad |x \ 4 \cdot 4 \ x| \quad [.2 \ .25 \ .3 \ .25] \begin{bmatrix} 5 \\ 6 \\ 3 \\ 4 \end{bmatrix} = 4.4$$

weight \times cat = cat \times score
weight score

final score