Name: Key

Applications of 6.2 and inverses

1) The softball and baseball teams submit equipment lists to their sponsors. Softball: 6 bats, 10 balls, and 16 uniforms. Baseball: 8 bats, 17 balls, and 20 uniforms. Each bat costs $75, each ball costs $12, and each uniform costs $70. Use matrix multiplication to find the total cost of equipment for each team.

$$\begin{matrix}\text{SOFT}\\ \text{BASE}\end{matrix}\begin{bmatrix}6 & 10 & 16\\ 8 & 17 & 20\end{bmatrix}\cdot\begin{bmatrix}75\\ 12\\ 70\end{bmatrix}\begin{matrix}\text{Bat}\\ \text{Ball}\\ \text{U}\end{matrix} = \begin{bmatrix}1690\\ 2204\end{bmatrix}$$

2×3 3×1

Softball $1,690

Baseball $2,204

2) The number of touchdowns (TD), field goals (FG), points after touchdown (PAT), two-point conversions (2EP) and a safety (STY) for the all-time three top NFL scoring teams for a season is shown in the table below. The other table shows the number of points each type of score is worth. Use the information to determine how many total points each team scored.

(A)

Score	Points
TD	6
FG	3
PAT	1
2EP	2
STY	2

5×1

(B)

Team	TD	FG	PAT	2EP	STY
Patriots (2007)	75	21	74	2	0
Vikings (1998)	64	35	59	3	1
Redskins (1983)	63	33	62	0	1

3×5

soo.... B·A

$$\begin{bmatrix}75 & 21 & 74 & 2 & 0\\ 64 & 35 & 59 & 3 & 1\\ 63 & 33 & 62 & 0 & 1\end{bmatrix}\begin{bmatrix}6\\ 3\\ 1\\ 2\\ 2\end{bmatrix} = \begin{bmatrix}589\\ 556\\ 541\end{bmatrix}\begin{matrix}\text{NE}\\ \text{V}\\ \text{R}\end{matrix}$$

3) Find the determinant of $\begin{bmatrix}-4 & 7\\ -3 & 6\end{bmatrix}$.

$-24 - -21$

-3

4) Find the inverse of $\begin{bmatrix}-4 & 7\\ -3 & 6\end{bmatrix}$.

$$\frac{1}{-3}\begin{bmatrix}6 & -7\\ 3 & -4\end{bmatrix} = \begin{bmatrix}-2 & 7/3\\ -1 & 4/3\end{bmatrix}$$

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3) Find the determinant of $\begin{bmatrix}-4 & 7\\ -3 & 6\end{bmatrix}$.

4) Find the inverse of $\begin{bmatrix}-4 & 7\\ -3 & 6\end{bmatrix}$.

5) Show that $\begin{bmatrix} -6 & 2 \\ 7 & -2 \end{bmatrix}$ and $\begin{bmatrix} 1 & 1 \\ 3.5 & 3 \end{bmatrix}$ are inverses of one another.

(A) (B)

OPTION 1

$\frac{1}{12-14}\begin{bmatrix} -2 & -2 \\ 7 & -6 \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ 7/2 & 3 \end{bmatrix}$ matches B!

$\frac{1}{3-3.5}\begin{bmatrix} 3 & -1 \\ -3.5 & 1 \end{bmatrix} = \begin{bmatrix} -6 & 2 \\ 7 & -2 \end{bmatrix}$ matches A!

OPTION 2

B·A OR A·B should yield $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ Identity!

6) Solve the equation for the matrix X.

$$\begin{bmatrix} 1 & 3 \\ 10 & -6 \end{bmatrix} X = \begin{bmatrix} -2 & 2 \\ -56 & 20 \end{bmatrix}$$

(A) (B)

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

$X = \begin{bmatrix} -5 & 2 \\ 1 & 0 \end{bmatrix}$

7) Solve the equation for the matrix X.

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} X = \begin{bmatrix} -10 & 12 \\ -18 & 20 \end{bmatrix}$$

(A) (B)

$[A]^{-1}[A] X = [A]^{-1}[B]$

$X = \begin{bmatrix} 2 & -4 \\ -6 & 8 \end{bmatrix}$

can ✓ them all!

8) Solve the equation for the matrix X.

$$\begin{bmatrix} 0 & -8 \\ 4 & 3 \end{bmatrix} X = \begin{bmatrix} 40 & 56 \\ -19 & -33 \end{bmatrix}$$

(A) (B)

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

$X = \begin{bmatrix} -1 & -3 \\ -5 & -7 \end{bmatrix}$

5) Show that $\begin{bmatrix} -6 & 2 \\ 7 & -2 \end{bmatrix}$ and $\begin{bmatrix} 1 & 1 \\ 3.5 & 3 \end{bmatrix}$ are inverses of one another.

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