4.2 Matrix Multiplication

The equipment manager at Bemidji State University needs your help to find how much the men’s and women’s basketball teams are spending. The boosters were on his case that money was not being spent evenly. The men’s team needs to buy the following equipment: 10 uniforms, 21 basketballs and 20 towels. The women’s team needs to buy 11 uniforms 22 basketballs and 0 towels. Create and label a 2x3 equipment matrix.

The cost for the equipment is $85 per uniform, $75 per basketball and $8 per towel. Create and label a 3x1 cost matrix.

By looking at the numbers, which team do you think spends more money and why?

Use matrix multiplication to multiply the equipment matrix by the cost matrix.

How much does each team spend?

Solve the following matrix multiplication problems for x and y.

$$\left[\begin{matrix}2&4\\x&1\\-3&5\end{matrix}\right]\left[\begin{matrix}5\\y\end{matrix}\right]=\left[\begin{matrix}-14\\24\\-45\end{matrix}\right]$$

$$\left[\begin{matrix}-2&x\\0&8\end{matrix}\right]\left[\begin{matrix}5&2\\3&4\end{matrix}\right]=\left[\begin{matrix}2&12\\y&32\end{matrix}\right]$$

$$\left[\begin{matrix}3&4&2\\5&3&-3\\-8&x&2\end{matrix}\right]\left[\begin{matrix}3&4&5\\6&-2&1\\1&9&0\end{matrix}\right]=\left[\begin{matrix}35&y&19\\30&-13&28\\-82&6&-50\end{matrix}\right]$$