Algebraic Reasoning

Unit 5, Bundle 3 Summative Assessment key

1. Determine whether or not the two matrices can be multiplied as *CD* and justify your answer? (AR.5B)

$$C=\left[\begin{matrix}7&-4\\-3&1\\0&8\end{matrix}\right] D=\left[\begin{matrix}-7&1&1\\9&0&8\end{matrix}\right]$$

* 1. No, because *C* has 2 columns and *D* has 2 rows.
	2. **Yes, because *C* has 2 columns and *D* has 2 rows.**
	3. No, because *C* and *D* do not have the same number of rows and columns.
	4. Yes, because *C* has 3 rows and *D* has 3 columns.
1. Find *AB* if: (AR. 5B)

$$A=\left[\begin{matrix}-6&-5&3\\0&4&7\end{matrix}\right] B=\left[\begin{matrix}-6&0\\10&5\\9&-7\end{matrix}\right]$$

1. $\left[\begin{matrix}116&-75\end{matrix}\right]$
2. $\left[\begin{matrix}36&0\\-50&20\\27&-49\end{matrix}\right]$
3. $\left[\begin{matrix}13&-46\\103&-49\end{matrix}\right]$
4. $\left[\begin{matrix}36&-50&27\\0&40&63\\0&-25&-21\end{matrix}\right]$
5. Write a matrix equation to represent the system of linear equations and solve the system using matrices. (AR.5D)

$$\begin{matrix}5y=-4-3x\\4x=18-2y\end{matrix}$$

* 1. $\left[\begin{matrix}3&4\\5&2\end{matrix}\right]\left[\begin{matrix}x\\y\end{matrix}\right]=\left[\begin{matrix}4\\18\end{matrix}\right] \left[\begin{matrix}x\\y\end{matrix}\right]=\left[\begin{matrix}7\\-5\end{matrix}\right]$
	2. $\left[\begin{matrix}3&5\\4&2\end{matrix}\right]\left[\begin{matrix}x\\y\end{matrix}\right]=\left[\begin{matrix}-4\\-18\end{matrix}\right] \left[\begin{matrix}x\\y\end{matrix}\right]=\left[\begin{matrix}7\\-5\end{matrix}\right]$
	3. $\left[\begin{matrix}3&5\\4&2\end{matrix}\right]\left[\begin{matrix}x\\y\end{matrix}\right]=\left[\begin{matrix}-4\\18\end{matrix}\right] \left[\begin{matrix}x\\y\end{matrix}\right]=\left[\begin{matrix}7\\-5\end{matrix}\right]$
	4. $\left[\begin{matrix}3&4\\5&2\end{matrix}\right]\left[\begin{matrix}x\\y\end{matrix}\right]=\left[\begin{matrix}-4\\18\end{matrix}\right] \left[\begin{matrix}x\\y\end{matrix}\right]=\left[\begin{matrix}-5\\7\end{matrix}\right]$
1. Which matrix equation can be used to solve the system below?

$$\left\{\begin{matrix}y=x+2z+5\\3z=4x-y\\6x-7y+z=9\end{matrix}\right.$$

1. $\left[\begin{matrix}1&2&5\\3&4&-1\\6&7&1\end{matrix}\right]\left[\begin{matrix}x\\y\\z\end{matrix}\right]=\left[\begin{matrix}1\\0\\9\end{matrix}\right]$
2. $\left[\begin{matrix}-1&1&-2\\4&-1&3\\-6&7&-1\end{matrix}\right]\left[\begin{matrix}x\\y\\z\end{matrix}\right]=\left[\begin{matrix}-5\\0\\9\end{matrix}\right]$
3. $\left[\begin{matrix}1&1&2\\4&-1&3\\6&-7&1\end{matrix}\right]\left[\begin{matrix}x\\y\\z\end{matrix}\right]=\left[\begin{matrix}5\\0\\9\end{matrix}\right]$
4. $\left[\begin{matrix}1&-1&2\\4&-1&-3\\6&-7&1\end{matrix}\right]\left[\begin{matrix}x\\y\\z\end{matrix}\right]=\left[\begin{matrix}-5\\0\\9\end{matrix}\right]$