$$A\begin{bmatrix} 5 & 6 & 3 \\ 0 & -9 & 12 \end{bmatrix} \quad B\begin{bmatrix} 10 & 3 & 9 \\ 17 & -5 & 1 \end{bmatrix} \quad C\begin{bmatrix} -6 & -9 & -1 \\ 20 & -13 & 49 \end{bmatrix}$$

Enter these matrices on the calculator.

$$A\begin{bmatrix} 5 & 6 & 3 \\ 0 & -9 & 12 \end{bmatrix} \quad B\begin{bmatrix} 10 & 3 & 9 \\ 17 & -5 & 1 \end{bmatrix} \quad C\begin{bmatrix} -6 & -9 & -1 \\ 20 & -13 & 49 \end{bmatrix}$$

Find this matrix: 2A $2[A]$

$$2[A] = \begin{bmatrix} 10 & 12 & 6 \\ 0 & -18 & 24 \end{bmatrix}$$

this multiplies all elements in matrix A by 2.

$$A\begin{bmatrix} 5 & 6 & 3 \\ 0 & -9 & 12 \end{bmatrix} \quad B\begin{bmatrix} 10 & 3 & 9 \\ 17 & -5 & 1 \end{bmatrix} \quad C\begin{bmatrix} -6 & -9 & -1 \\ 20 & -13 & 49 \end{bmatrix}$$

2A is called scalar multiplication

A scalar is a real number.
When you multiply a matrix by a scalar you multiply each element in the matrix by that scalar.

$$A\begin{bmatrix} 5 & 6 & 3 \\ 0 & -9 & 12 \end{bmatrix} \quad B\begin{bmatrix} 10 & 3 & 9 \\ 17 & -5 & 1 \end{bmatrix} \quad C\begin{bmatrix} -6 & -9 & -1 \\ 20 & -13 & 49 \end{bmatrix}$$

Find the resultant matrix: 4B - 5C $= \begin{bmatrix} 70 & 57 & 41 \\ -32 & 45 & -241 \end{bmatrix}$

Find the resultant matrix: 3(A - B) $= \begin{bmatrix} -15 & 9 & -18 \\ -51 & -12 & 33 \end{bmatrix}$

A car dealership sells four different models of cars. The fuel economy (in mpg) is shown below. Organize this data using a matrix.

Economy car: 32 mpg in city driving, 40 mpg in highway driving
Mid-size car: 24 mpg in city driving, 34 mpg in highway driving
Mini-van: 18 mpg in city driving, 25 mpg in highway driving
SUV: 18 mpg in city driving, 22 mpg in highway driving

$$A = \begin{matrix} \text{ECON} \\ \text{MID} \\ \text{MINI} \\ \text{SUV} \end{matrix} \begin{bmatrix} 32 & 40 \\ 24 & 34 \\ 18 & 25 \\ 18 & 22 \end{bmatrix} \quad \begin{matrix} \text{CITY} & \text{HWY} \end{matrix}$$

multiply this matrix by 1.10

$$1.10A = \begin{bmatrix} 35.2 & 44 \\ 26.4 & 37.4 \\ 19.8 & 27.5 \\ 19.8 & 24.2 \end{bmatrix}$$

What does this new matrix represent?

Multiplying by 1.10 is a shortcut for finding the amount after a 10% increase. Therefore, this resulting matrix shows what the gas mileages would be if they are increased by 10%.