1. $A = [1\ 2; 3\ 4]$, $A.\hat{}2 =?$ $A\hat{}2 =?$

2. $A = [4\ \ -2; 1\ 3]$, $B = [1\ 2; 4\ 5]$, $A. * B =?$ $A * B =?$

3. Create a diagonal matrix with the commands $v = 1 : 3$ and $D = diag(v)$. Take the exponential of each element of the matrix D and explain the result.

4. The sum of the squares of the integers from 1 to n is given by the formula $\frac{n(n+1)(2n+1)}{6}$. Use the formula to determine the sum of the squares of the integers from 1 to 20, inclusive.

5. $a = 0, b = 10, n = 20$, use Matlab's $linspace(a, b, n)$ command to generate n equally spaced numbers between a and b for the given values of a, b, and n. Use Matlab's indexing notation to zero out every odd indexed entry.

6. Use Matlab's length function to find the length of each of the given vectors $w = 5 : 27$, $x = 1 : 0.01 : 5$, $y = 2 : 0.005 : 3$, $z = (100 : 0.5 : 200)'$.

7. Use Matlab's sum function and start:increment:finish construct to find the sum of the even integers from 1 to 1000.

8. Use Matlab's sum function and start:increment:finish construct to write the code that sums the squares of the integers from 1 to 20, inclusive.

9. $v = 3 : 7$, $v.\hat{}3 =?$, $v\hat{}3 =?$

10. $A = \begin{bmatrix} 1 & 2 & 3 & 0 \\ 5 & -1 & 0 & 0 \\ 3 & -2 & 5 & 0 \end{bmatrix}$, how does A change after each of the following assignments? $A(1, :) = 20 : 23, A(:, 2) = 11, A(5, 5) = 777.$

11. $A = ones(2, 3), C = [A; A], D = zeros(2, 3), E = [AD; DA], C =?, D =?, E =?$

12. $v = (1 : 5)', w = (2 : 6)'$, write the matlab command that computes the inner product vTw.

13. Use Matlab's ones command to create the matrices $A = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 2 & 2 \\ 2 & 2 & 2 \\ 2 & 2 & 2 \end{bmatrix}$, $C = \begin{bmatrix} 3 & 3 \\ 3 & 3 \end{bmatrix}$. Write a Matlab command that will build the block diagonal matrix $D = \begin{bmatrix} A & 0 & 0 \\ 0 & B & 0 \\ 0 & 0 & C \end{bmatrix}$ where the zeros in this matrix represent matrices of zeros of the appropriate size.