
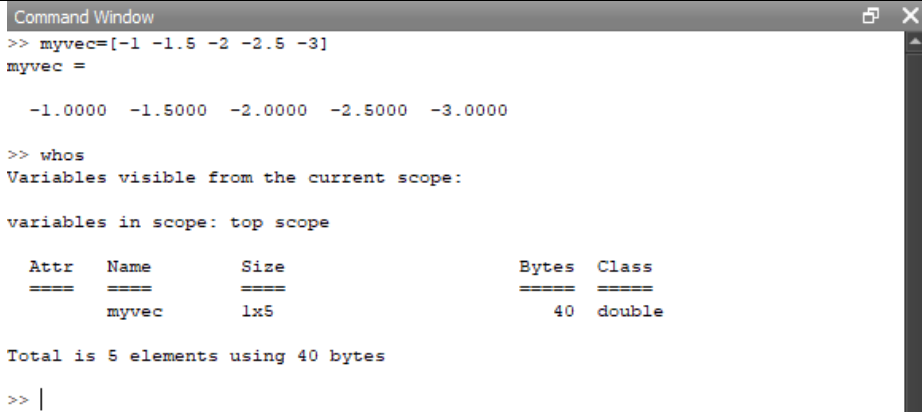
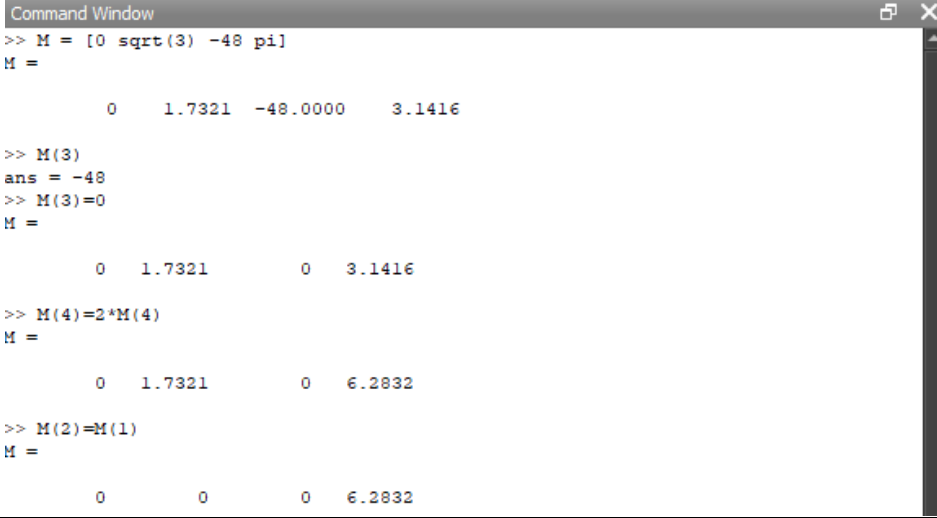
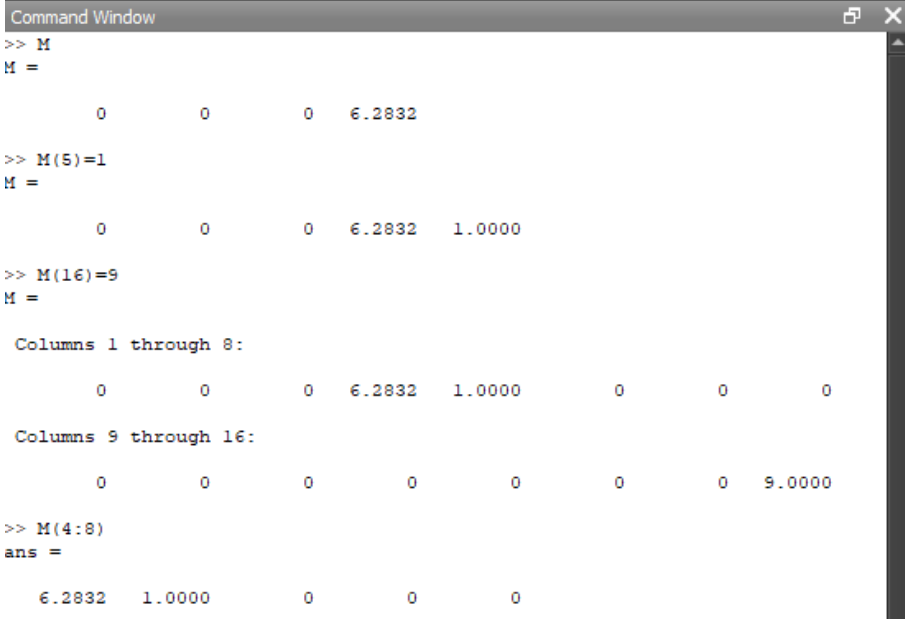
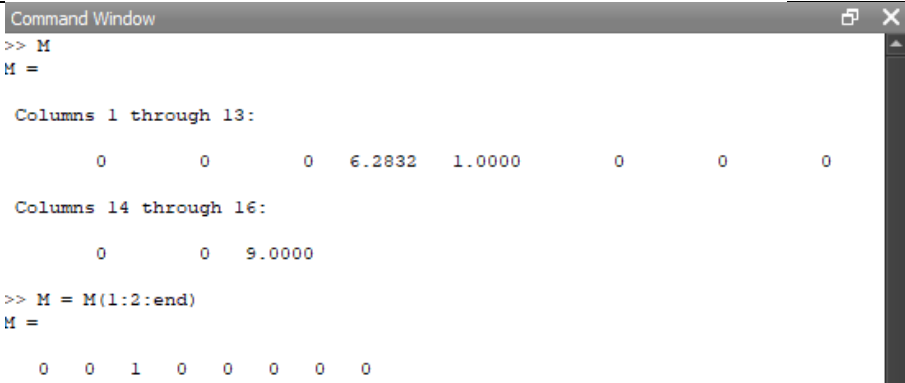
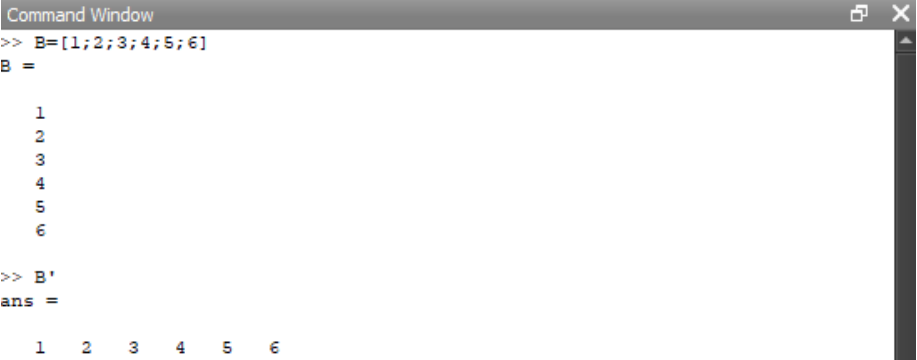


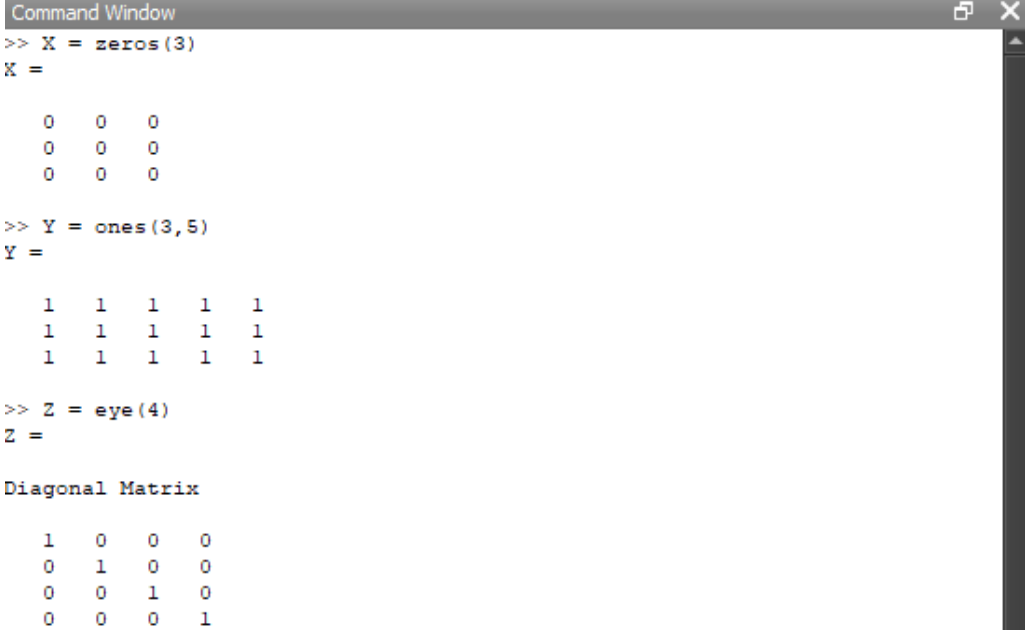


Material	Quest	Worksheets														
Arrays	Q1	<p>4. <u>Arrays</u>.</p> <p>MATLAB stands for _____. Indeed, Vectors and matrices are at the heart of MATLAB, and much of MATLAB's unique capabilities are due to its vector/matrix based computation. Even problems that don't seem to involve vectors are often more <i>efficiently</i> solved in MATLAB when they are rephrased in terms of vectors.</p>														
	Ans	MATLAB stands for Matrix Laboratory Indeed, Vectors and matrices are at the heart of MATLAB, and much of MATLAB's unique capabilities are due to its vector/matrix based computation.														
	Q2	<table><tr><th>Commands</th><th>Array created</th></tr><tr><td>[1:5]</td><td>[1 2 3 4 5]</td></tr><tr><td>[3:6]</td><td></td></tr><tr><td>[1:2:9]</td><td></td></tr><tr><td>[1:2:10.3]</td><td></td></tr><tr><td>[4:-1:0]</td><td></td></tr><tr><td>[3:2]</td><td></td></tr></table>	Commands	Array created	[1:5]	[1 2 3 4 5]	[3:6]		[1:2:9]		[1:2:10.3]		[4:-1:0]		[3:2]	
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Q3	<p>(b) Use the colon notation to generate the array myvec=[-1 -1.5 -2 -2.5 -3]</p> <p>Ans: _____</p> <p>How much memory does it take to store myvec? Ans: _____</p>															
Ans																
Q4	M = [0 sqrt(3) -48 pi]															

	<p>Round brackets can also be used to modify specific elements of the array. Explain what each of these commands does to M.</p> <p>a) $M(3) = 0$ b) $M(4) = 2 * M(4)$ c) $M(2) = M(1)$</p>
Ans	 <pre> Command Window >> M = [0 sqrt(3) -48 pi] M = 0 1.7321 -48.0000 3.1416 >> M(3) ans = -48 >> M(3)=0 M = 0 1.7321 0 3.1416 >> M(4)=2*M(4) M = 0 1.7321 0 6.2832 >> M(2)=M(1) M = 0 0 0 6.2832 </pre>
Q5	<p>(d) <u>Expand and contract</u>. Continuing with the array M. Explain carefully what happens when you type each of the following commands</p> <p>$M(5)=1$</p> <p>$M(16)=9$</p> <p>$M(4:8)$</p>
Ans	 <pre> Command Window >> M M = 0 0 0 6.2832 >> M(5)=1 M = 0 0 0 6.2832 1.0000 >> M(16)=9 M = Columns 1 through 8: 0 0 0 6.2832 1.0000 0 0 0 Columns 9 through 16: 0 0 0 0 0 0 0 9.0000 >> M(4:8) ans = 6.2832 1.0000 0 0 0 </pre>
Q6	<p>What single command can we use to shrink M by discarding all the even entries? (i.e. replace M by a smaller version of itself, keeping only $M(1)$, $M(3)$, $M(5)$ etc.)</p>
Ans	 <pre> Command Window >> M M = Columns 1 through 13: 0 0 0 6.2832 1.0000 0 0 0 Columns 14 through 16: 0 0 9.0000 >> M = M(1:2:end) M = 0 0 1 0 0 0 0 0 </pre>

Q7	<p>i) Separate array entries using a semicolon ; (rather than spaces). Try creating</p> $B=[1;2;3;4;5;6]$ <p>ii) Use the apostrophe ' to <i>transpose</i> a row vector. What command will create the column vector $B = \begin{pmatrix} 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \end{pmatrix}$ using method ii)?</p>
Ans	 <pre> Command Window >> B=[1;2;3;4;5;6] B = 1 2 3 4 5 6 >> B' ans = 1 2 3 4 5 6 </pre>
Q8	<p>5. <u>Matrices</u>. We can think matrices as layers of row vectors, each layer separated by ; as in the previous activity. For example, try</p> $\text{mat} = [3 \ 4 \ 5; \ 0 \ 9 \ 8]$
Ans	 <pre> Command Window >> mat = [3 4 5; 0 9 8] mat = 3 4 5 0 9 8 </pre>
Q9	<p>(a) Explain what the command <code>mat(1,3)</code> shows you.</p> <p>(b) Explain what the command <code>mat(:,2)</code> shows you.</p> <p>(c) How can you add <code>[0 3 6]</code> to <code>mat</code> as its third row ? (preferably without typing out <code>mat</code> all over again.)</p> <p>(d) How can you swap the rows and columns of <code>mat</code> (keeping the result as <code>mat</code>)?</p>
Ans	 <pre> Command Window >> mat mat = 3 4 5 0 9 8 >> mat(1,3) ans = 5 >> mat(:,2) ans = 4 9 >> mat = [mat;0 3 6] mat = 3 4 5 0 9 8 0 3 6 >> mat' ans = 3 0 0 4 9 3 5 8 6 </pre>

Q10	<p>(e) What commands can be used to quickly generate these matrices? (use a single command in each case.)</p> $X = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}, \quad Y = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix} \quad Z = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$
Ans	 <pre>Command Window >> X = zeros(3) X = 0 0 0 0 0 0 0 0 0 >> Y = ones(3,5) Y = 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 >> Z = eye(4) Z = Diagonal Matrix 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1</pre>