Name	
Signature	

General instructions: You may not ask questions during the test. If you believe that there is something wrong with a question, write down what you think the question is trying to ask and answer that.

Question	Points	Score
1	4	
2	4	
3	4	
4	4	
5	4	
6	4	
7	4	
8	4	
9	4	
10	4	
11	4	
12	4	
13	4	
14	4	
15	4	
16	4	
17	4	
18	4	
19	4	
20	4	
21	4	
22	4	
23	4	
24	4	
25	4	
Total	100	

1. Which statement assigns the value 3 to the variable `myNum` and prints the value of `myNum` to the command window?

   (a) `myNum == 2 + 1;`

   (b) `myNum = 2 + 1;`

   (c) `myNum == 3`

   (d) `myNum = 2 + 1`

   (e) `myNum = 3;`

2. What is the value of oranges after the following code executes?

```
apples = 8;
oranges = 2;
oranges = oranges + apples;
apples = apples - 1;
```

   (a) 10

   (b) 9

   (c) 8

   (d) 7

   (e) 2

3. Which of the following is not a valid Matlab identifier?

   (a) `MyNumber`

   (b) `my_array2`

   (c) `myArray`

   (d) `start`

   (e) `end`

4. Indicate whether each statement is true or false.
(T/F) A double precision number's range is about 100 times greater than a single precision number's range.
(T/F) Following the assignment `myNum = 4`, the variable `myNum` will be of type `int32`.
(T/F) Floating point numbers can represent larger numbers than unsigned integers.
(T/F) Due to rounding error, it is not necessarily true that `(a + b) + c = a + (b + c)` for some floating points values a, b, c.
(T/F) `eps(number)` will give the relative error associated with representing that number in floating point.
(T/F) Computing `0/0` will yield the value `Inf`.
(T/F) Computing `Inf - Inf` with yeild the value `NaN`.

5. Using the precendence rules for arithmetic operators, determine which statement is true.

   (a) `2 / 2 * 3 == 2 / 6`

   (b) `2 ^ 2 * 2 == 16`

   (c) `1 + 2 * 3 == 9`

   (d) `4 / 2 + 2 == 4`

   (e) `2 - 3 * 2 == -2`

6. Consider the function definition,

```
function [ apples, oranges ] = MyFunction( pears )
  apples = pears * 2;
  oranges = pears - 1;
end
```

and the following code that calls this function:

```
apples = 1;
oranges = 2;
pears = 3;
[ oranges, pears ] = MyFunction( apples );
```

What will be the value of `apples`, `oranges`, and `pears` after the code executes?

(a) apples = 1, oranges = 0, and pears = 2

(b) apples = 6, oranges = 2, and pears = 3

(c) apples = 1, oranges = 2, and pears = 0

(d) apples = 6, oranges = 2, and pears = 3

(e) apples = 1, oranges = 2, and pears = 3

7. Which statement regarding functions and scripts is false?

(a) By default, variables defined in a script will be visible in the main workspace.

(b) By default, variables defined in a function will not be visible in the main workspace.

(c) Functions can be called with multiple input parameters.

(d) Scripts are terminated with the `end` keyword.

(e) Scripts are not called with input parameters.

8. For each `fprintf` statement in the left column, draw a line to the corresponding output in the right column.

`fprintf('--%4.2f--', 3.1415926)|`	`--3.141593--`
`fprintf('--%5.2f--', 3.1415926)`	`--3.14--`
`fprintf('--%4.2e--', 3.1415926)`	`--3.14e+00--`
`fprintf('--%f--', 3.1415926)`	`-- 3.14--`

9. Which statement regarding 1D arrays is true?

(a) `myArray = [ 1, 2, 3, 4 ];` creates a row array of size 4 × 1.

(b) `myArray = [ 1, 2, 3, 4 ]';` creates a row array of size 4 × 1.

(c) `myArray = [ 3:-1:0 ];` creates a row array of size 1 × 3.

(d) `myArray = [ 1:2:4 ];` creates a row array of size 1 × 3.

(e) `myArray = [ 1:7 ]'; myArray(6) = [];` results in an array of size 6 × 1.

10. Consider the following code:

```
myArray = [ 1:10 ];
smallNumbers = myArray < 5;
smallNumbersArray = myArray(smallNumbers);
```

Indicate whether each statement is true or false.
(T/F) `smallNumbersArray` has length 5.
(T/F) `smallNumbers` is of class logical.
(T/F) The code above generates an error.
(T/F) The relational operation in the second line of code is evaluated elementwise.

11. Given `myArray = [ 10, 20, 30, 40, 50 ]`, match the statement in the left column with the resulting array in the right column.

`myArray(end-1:-1:1)`	`error`
`myArray(2,5)`	`empty matrix`
`myArray(myArray<1)`	`[40, 30, 20, 10]`
`myArray(6)`	`error`

12. Consider the following code:

```
apples = 3;
oranges = 2;
pears = 1;
```

Indicate whether each statement is true or false.
(T/F) `apples <= oranges+1`
(T/F) `apples ~= oranges+1`
(T/F) `(apples > oranges) & (pears < 2)`
(T/F) `(apples < oranges) | (pears < 2)`
(T/F) `(pears & apples) < oranges`

13. Consider two floating point numbers, `x` and `y`, whose values lie between 1 and 10. Which of the following might be a good way to test for equality of `x` and `y`?

(a) `abs(x-y) < 1`

(b) `x == y`

(c) `y-x < .00001`

(d) `abs(x+y) < .00001`

(e) None of the above.

14. Fill in the following truth tables.

X	Y	and(X,Y)
0	0	
0	1	
1	0	
1	1	

X	Y	xor(X,Y)
0	0	
0	1	
1	0	
1	1	

X	Y	or(not(X),Y)
0	0	
0	1	
1	0	
1	1	

15. Let

```
x = [ 1, 2, 3, 4 ];
y = [ -1, 0, 1, 2 ];
```

For each expression below, use the space provided to write the value of the expression or `error` if the expression is not valid Matlab code.

`x .* y`	
`x .^ y`	
`x * y`	
`x * y'`	
`x .\ y`	
`x .+ y`	
`x - 2`	

16. For each expression below, use the space provided to write the value of the expression or `error` if the expression is not valid Matlab code.

`not([ 0, 1, 1, 0 ])`	
`[ 0, 1, 0 ] & [ 1, 0, 0 ]`	
`[ 0, 1, 0 ] | 1`	
`not([ 0, 1, 0 ]) & 1`	

17. Given the array `myArray = [ -1, 2, 0, 4, -5 ]`, which statement sets all of the negative elements of `myArray` to 0?

(a) `myArray = (myArray >= 0) .* myArray`

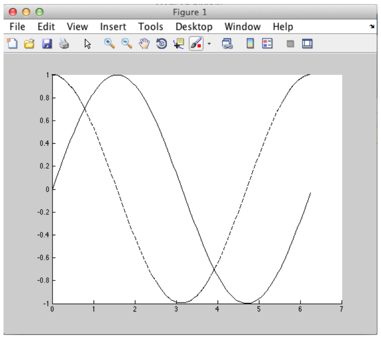
(b) `myArray = (myArray < 0) .* myArray`

(c) `myArray = (myArray ~= 0) .* myArray`

(d) `myArray(myArray<0) = myArray & 0`

(e) None of the above.

18. Which code generated the figure shown?



(a)
```
x = [0:1:2*pi];
y = sin(x);
z = cos(x);
hold on
plot(x,y,'-k');
plot(x,z,'-k');
```

(b)
```
x = [0:.01:2*pi];
y = sin(x);
z = cos(x);
plot(x,y,'-k');
plot(x,z,'-k');
```

(c)
```
x = [0:.05:2*pi];
y = sin(x);
z = cos(x);
plot(x,y,'-k');
plot(x,z,'-.k');
```

(d)
```
x = [0:.05:2*pi];
y = sin(x);
z = cos(x);
hold on
plot(x,y,'-k');
plot(x,z,'-.k');
```

(e)
```
x = [0:.05:2*pi];
y = sin(x);
z = cos(x);
subplot(1,2,1)
plot(x,y,'-k');
subplot(1,2,2)
plot(x,z,'-.k');
```

19. Consider the following code.

```
x = [ 1, 2, 3, 4 ];
y = 7;
z = 1;
save MyFile y z;
```

Which statment is true?

(a) All of the variables in the workspace are saved to a file `MyFile.mat`.

(b) `load MyFile` loads the value of `x` into the workspace.

(c) `load MyFile z` loads only the value of `z` into the workspace.

(d) The code above would generate an error.

(e) None of the above.

20. Indicate whether each statement is true or false.
(T/F) `myName = 'Sam'; myName(4) = 'e'` results in `myName == 'Same'`.
(T/F) The command `uint8('ABC')` will display the ASCII code for the letters `A`,`B`, and `C`.
(T/F) `char('Hello','my','name','is','Sam')` will create another string by concatenating the input strings.
(T/F) The code `'Sam' == 'sam'` generates `true`.
(T/F) The code `lower('Sam') == 'sam'` generates `true`.

21. Consider the following code:

```
myString = 'Hello, how are you doing 2day?  '
isSpaceArray = isspace(myString);
myString2 = myString(~isSpaceArray)
myString3 = myString(isletter(myString))
```

Which statment is <u>false</u> after the code runs?

(a) `myString2 == 'Hello,howareyoudoing2day?'`

(b) `myString3` has 22 elements.

(c) `strrep(myString2,'2','to')` results in the string `'Hello,howareyoudoingtoday?'`

(d) `find(myString == 'h')` returns the array `[1,8]`.

(e) `lower(myString2) == 'hello,howareyoudoing2day?'`.

22. Match the statement in the left column with the resulting value in the right column.

`myArray = [ 1, 2, 3, 4; 5, 6, 7, 8 ]`	$\begin{bmatrix}1 & 2 & 3 & 4\\ 5 & 6 & 7 & 8\end{bmatrix}$
`myArray = [ 1, 2, 3, 4; 5, 6, 7, 8]’`	$\begin{bmatrix}1 & 5\\ 2 & 6\\ 3 & 7\\ 4 & 8\end{bmatrix}$
`myArray = [ [1, 2]; [4, 5, 6] ]`	`error`
`myArray = [ 1, 2, 3; 5, 6, 7 ];myArray(2,1) = 4`	$\begin{bmatrix}1 & 2 & 3\\ 4 & 6 & 7\end{bmatrix}$

23. For 2D arrays, which statement is <u>false</u>?

(a) Row-column indexing uses two numbers to index the array while linear indexing uses one number.

(b) If the linear index of element (m,n) is k, then the linear index of element (m,n+1) is k+1.

(c) The second column of a 3 × 2 array `myArray` would be accessed as `myArray(:,2)`.

(d) The first row of a 3 × 2 array `myArray` would be accessed as `myArray(1,:)`.

(e) For `x = [ 1, 2, 3 ]` and `y = [ 1, 2 ]`, `x' * y` yields a 3 × 2 array.

24. Let

```
myArray  = [ 1, 2, 3, 4; 5, 6, 7, 8; 9, 10, 11, 12 ]
```

Which statement is <u>false</u>?

(a) `myArray(:,3)=[]` deletes the third column of `myArray`.

(b) `myArray(1:2,3:4)` gives the array `[ 3, 4; 7, 8 ]`.

(c) `myArray([3:-1:1],1)` gives the array `[ 9, 5, 1 ]'`.

(d) `myArray([1, 1, 1],1)` gives an error.

(e) `myArray([1:2:3],[1:2])` is equivalent to `myArray(1:2:3,1:2)`.

25. Let

```
myArray  = [ 10, 20, 30, 40; -5, 6, 0, 1; 1, -2, 11, 3 ]
```

Indicate whether each statement is true or false.
(T/F) `myArray2 = myArray(:)` results in `myArray2` having size 12×1.
(T/F) `myArray2 = reshape(myArray,4,3)` results in `myArray2` having size 4×3.
(T/F) `myArray2 = reshape(myArray,2,2)` results in `myArray2` having size 2×2.
(T/F) The statement `myArray(:) = myArray(:) + [1:12]'` will change the shape of `myArray`.
(T/F) `reshape(myArray,12,1)` yields a 1D column array.