

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` will yield the value `NaN`.

5. Using the precedence 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.

<code>fprintf('--%4.2f--', 3.1415926)</code>	<code>--3.14--</code>
<code>fprintf('--%5.2f--', 3.1415926)</code>	<code>-- 3.14--</code>
<code>fprintf('--%4.2e--', 3.1415926)</code>	<code>--3.14e+00--</code>
<code>fprintf('--%f--', 3.1415926)</code>	<code>--3.141593--</code>

9. Which statement regarding 1D arrays is true?

- (a) `myArray = [ 1, 2, 3, 4 ]`; creates a row array of size  $4 \times 1$ .
- (b) `myArray = [ 1, 2, 3, 4 ]'`; creates a row array of size  $4 \times 1$ .
- (c) `myArray = [ 3:-1:0 ]`; creates a row array of size  $1 \times 3$ .
- (d) `myArray = [ 1:2:4 ]`; creates a row array of size  $1 \times 3$ .
- (e) `myArray = [ 1:7 ]'`; `myArray(6) = []`; results in an array of size  $6 \times 1$ . ←

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)	[40, 30, 20, 10]
myArray(2,5)	error
myArray(myArray<1)	empty matrix
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
0	1	0
1	0	0
1	1	1

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

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

<code>x .* y</code>	<code>[ -1, 0, 3, 8 ]</code>
<code>x .^ y</code>	<code>[ 1, 1, 3, 16 ]</code>
<code>x * y</code>	<b>error</b>
<code>x * y'</code>	<code>10</code>
<code>x .\ y</code>	<code>[ -1.0000, 0, .3333, .5000 ]</code>
<code>x .+ y</code>	<b>error</b>
<code>x - 2</code>	<code>[ -1, 0, 1, 2 ]</code>

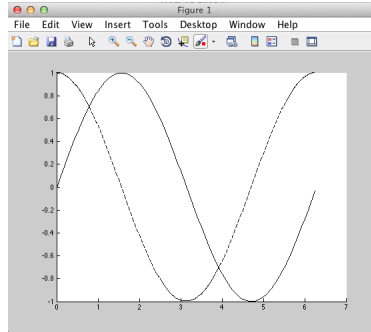
16. For each expression below, use the space provided to write the value of the expression or **error** if the expression is not valid Matlab code.

<code>not([ 0, 1, 1, 0 ])</code>	<code>[ 1, 0, 0, 1 ]</code>
<code>[ 0, 1, 0 ] &amp; [ 1, 0, 0 ]</code>	<code>[ 0, 0, 0 ]</code>
<code>[ 0, 1, 0 ]   1</code>	<code>[ 1, 1, 1 ]</code>
<code>not([ 0, 1, 0 ]) &amp; 1</code>	<code>[ 1, 0, 1 ]</code>

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)  $\Leftarrow$

`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 statement 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.  $\Leftarrow$
- (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 statement is false 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 false?

- (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  $3 \times 2$  array `myArray` would be accessed as `myArray(:,2)`.
- (d) The first row of a  $3 \times 2$  array `myArray` would be accessed as `myArray(1,:)`.
- (e) For `x = [ 1, 2, 3 ]` and `y = [ 1, 2 ]`, `x' * y` yields a  $3 \times 2$  array.

24. Let

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

Which statement is false?

- (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.  $\Leftarrow$
- (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  $12 \times 1$ .
- (T/F) `myArray2 = reshape(myArray,4,3)` results in `myArray2` having size  $4 \times 3$ .
- (T/F) `myArray2 = reshape(myArray,2,2)` results in `myArray2` having size  $2 \times 2$ .
- (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.