Solution to HW1

Introduction to MATLAB Course

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Question1

```
clc; clear; close all;
a = 10;
b = 2.5 * 1e23;
c = 2 + 3*1i;
d = exp(1j*2*pi/3);
```

Question 2

```
aVec = [ 3.14 15 9 26]
```

```
aVec = 1×4
    3.1400   15.0000    9.0000   26.0000
```

```
bVec = [2.71; 8; 28; 182]
```

```
bVec = 4×1
    2.7100
    8.0000
   28.0000
  182.0000
```

```
cVec = [5:-0.2:-5]
```

```
cVec = 1×51
    5.0000    4.8000    4.6000    4.4000    4.2000    4.0000    3.8000    3.6000 ···
```

```
dVec = logspace(0,1,100)
```

```
dVec = 1×100
    1.0000    1.0235    1.0476    1.0723    1.0975    1.1233    1.1498    1.1768 ···
```

```
eVec = 'Hello'
```

```
eVec =
'Hello'
```

Question 3

```
aMat = 2*ones(9,9)
```

```
aMat = 9×9
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
```

```
aMat2 = 2 + zeros(9,9)
```

```
aMat2 = 9×9
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
```

```
bMat_diag = [1:5,4:-1:1]
```

```
bMat_diag = 1×9
     1     2     3     4     5     4     3     2     1
```

```
bMat = diag(bMat_diag)
```

```
bMat = 9×9
     1     0     0     0     0     0     0     0     0
     0     2     0     0     0     0     0     0     0
     0     0     3     0     0     0     0     0     0
     0     0     0     4     0     0     0     0     0
     0     0     0     0     5     0     0     0     0
     0     0     0     0     0     4     0     0     0
     0     0     0     0     0     0     3     0     0
     0     0     0     0     0     0     0     2     0
     0     0     0     0     0     0     0     0     1
```

```
cMat = reshape(1:100, 10, 10)
```

```
cMat = 10×10
     1    11    21    31    41    51    61    71    81    91
     2    12    22    32    42    52    62    72    82    92
     3    13    23    33    43    53    63    73    83    93
     4    14    24    34    44    54    64    74    84    94
     5    15    25    35    45    55    65    75    85    95
```

```
     6    16    26    36    46    56    66    76    86    96
     7    17    27    37    47    57    67    77    87    97
     8    18    28    38    48    58    68    78    88    98
     9    19    29    39    49    59    69    79    89    99
    10    20    30    40    50    60    70    80    90   100
```

```
dMat = NaN(3,4)
```

```
dMat = 3×4
   NaN   NaN   NaN   NaN
   NaN   NaN   NaN   NaN
   NaN   NaN   NaN   NaN
```

```
eMat = [13 -1 5; -22 10 -87]
```

```
eMat = 2×3
    13    -1     5
   -22    10   -87
```

```
fMat = (floor(7*rand(5,3)) - 3)
```

```
fMat = 5×3
    -1     0     2
    -3    -1    -1
     3     3    -2
     3    -1    -1
     0    -3    -3
```

```
fMat_p = randi([-3,3],5,3)
```

```
fMat_p = 5×3
    -3    -2    -2
     3    -1     1
     3     2     2
     1    -3     1
    -3    -3     0
```

Question 4

```
x = 1/(1+ exp(-(a-15)/6))
```

```
x = 0.3029
```

```
y = (sqrt(a) + b^(1/21))^pi
```

```
y = 6.2696e+03
```

```
z = (log( (real( (c+d)*(c-d) )) * (sin(a*pi/3)) ))/(c* conj(c))
```

```
z = 0.1046
```

Question 5

```
aMat_comp = (aVec*bVec)
```

```
aMat_comp = 5.1125e+03
```

```
aMat = aMat_comp * (aMat ^2)
```

```
aMat = 9×9
10^5 ×
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405 ···
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
```

```
yMat = (bVec * aVec)
```

```
yMat = 4×4
10^3 ×
    0.0085    0.0406    0.0244    0.0705
    0.0251    0.1200    0.0720    0.2080
    0.0879    0.4200    0.2520    0.7280
    0.5715    2.7300    1.6380    4.7320
```

```
cMat_det = det(cMat)
```

```
cMat_det = 0
```

```
zMat = cMat_det * (aMat * bMat)'
```

```
zMat = 9×9
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
```

Question 6

```
cSum = sum(cMat,1)
```

```
cSum = 1×10
    55   155   255   355   455   555   655   755   855   955
```

```
eMean = mean(eMat,2)
```

```
eMean = 2×1
     1
   -33
```

```
eMat(1,:) = [1,1,1]
```

```
eMat = 2×3
     1     1     1
   -22    10   -87
```

```
cSub = cMat(2:9,2:9)
```

```
cSub = 8×8
    12    22    32    42    52    62    72    82
    13    23    33    43    53    63    73    83
    14    24    34    44    54    64    74    84
    15    25    35    45    55    65    75    85
    16    26    36    46    56    66    76    86
    17    27    37    47    57    67    77    87
    18    28    38    48    58    68    78    88
    19    29    39    49    59    69    79    89
```

```
lin = 1:20
```

```
lin = 1×20
     1     2     3     4     5     6     7     8     9    10    11    12    13 ···
```

```
% lin = lin(1:2:end) * (-1) ?!!!
r = rand(1,5)
```

```
r = 1×5
    0.1835    0.3685    0.6256    0.7802    0.0811
```

```
find(r < 0.5)
```

```
ans = 1×3
     1     2     5
```

```
r([2,4]) = 0
```

```
r = 1×5
    0.1835         0    0.6256         0    0.0811
```