

# Appendices

## Part 1

H = [8;5;-6]

I = [0;1;-4]

J = [8,4,-7]

k = [6;4;0;1]

L = [10;7]

p = 0.32

q = 2.45

r = -0.4

```
(a) H.*I
      %multiplies matrix H with matrix I
```

```
Ans =
      0
      5
     -24
```

```
(b) p.*k
      %multiplies scalar p with vector k
```

```
Ans =
      1.9200
      1.2800
           0
      0.3200
```

```
(C) L*H
```

```
%The matrix "L" is not invertible therefore matlab shows an error.
```

```
Error using *
Inner matrix dimensions must agree.
```

(d)  $J' - k$

%Inner Dimensions don't agree, therefore mat lab shows an error

Error using -  
Matrix dimensions must agree.

2)

%These are the vectors for question 2 , part 1

```
A = [0;0]
B = [1;10]
C = [9;12]
D = [17;-8]
E = [4;-1]
F = [8;9]
```

%x axis and y axis :

```
X=[0;1;9;17;4;8]
Y=[0;10;12;-8;-1;9]
```

```
plot(X,Y)
xlabel('X')
ylabel('Y')
title(Enter your name here')
```

%adding up all the vectors :

```
A+B+C+D+E+F
```

```
ans =
```

```
39
22
```

%Adding up all the norms = Total distance traveled by the boat  
norm(A)+norm(B)+norm(C)+norm(D)+norm(E)+norm(F)

```
ans =
```

```
60.0029
```

```
%Question 3 Part 1
%Where v and y are any variables , all matrices are set and ready for the equation
x = [-2:0.1:2];

v = 10 + (4.*x) + (x.*x);

p = 7 + (2.*x.*x);

y = sin(x.*x) + (v/p);

plot (x,y)
xlabel('X')
ylabel('Y')
title('Enter your Name here')
```

## Part 2

```
%all matrices have been set  
F = [3,9;7,-2;3,0;6,8;9,6;5,2]  
G = [-9,4,8,5,-1,2;7,-1,-2,9,3,3]  
Q = [2,-7,2;1,0,6;-5,3,5]  
U = [1,0;0,1]
```

```
(a)  
%A simple matrix operation was performed , matrix F times matrix G times  
scalar r which was defined previously  
F*G*r  
ans =  
  
-42.0000  
-15.2000  
-9.6000  
-48.0000  
-50.4000  
-23.2000
```

(b)

`%W is equal to matrix F minus the transverse of matrix G`

`W = F - G'`

`W =`

```
    12  2
     3 -1
    -5  2
     1 -1
    10  3
     3 -1
```

`Sort(W) %After getting W , the sort command was used`

`ans =`

```
    -5 -1
     1 -1
     3 -1
     3  2
    10  2
    12  3
```

(c)

`[1 2 3 4 5 6]' = %Asked to plot sort W using the matrix X as x indices`

`X =`

```
    1
    2
    3
    4
    5
    6
```

`plot(sort(W),X)`

`xlabel('X')`

`ylabel('Y')`

`title('Enter Your Name Here')`

(d)

```
%Simple matrix operation was performed , matrix U times matrix G  
U*G
```

```
ans =
```

```
-9  4  8  5 -1  2  
 7 -1 -2  9  3  3
```

(e)

```
%Simple matrix operation was performed , matrix F times matrix U  
F*U
```

```
ans =
```

```
 3  9  
 7 -2  
 3  0  
 6  8  
 9  6  
 5  2
```

(f)

```
%Simple matrix operation was performed , matrix Q times matrix H
```

```
Q*H
```

```
ans =
```

```
-31  
-28  
-55
```

```
(g) %multiply the scalar r which was defined earlier with the matrix G plus
scalar p (defined earlier) with the transverse of matrix F
(q*G)+(p*F')
```

```
ans =
```

```
Columns 1 through 3
```

```
-21.0900 12.0400 20.5600
20.0300 -3.0900 -4.9000
```

```
Columns 4 through 6
```

```
14.1700 0.4300 6.5000
24.6100 9.2700 7.9900
```

2)

```
A = [9,3,5;1,4,6;2,7,1]
```

```
b = [5;1;3]
```

```
Ax=b
```

```
%to find b : x = A\b
```

```
%original vector x
```

```
ans =
```

```
52
40
34
```

3)

```
%set up the matrix
A = [1, -1, 0, 0, 0, 0; 0, 1, -1, 0, 0, 0; 0, 0, 1, -1, 0, 0; 0, 0, 0, 1, -1, 0; 0, 0, 0, 0, 1, -1; -
1, 0, 0, 0, 0, 1]
b = [75; -60; 105; -120; 65; -65]
x = A' .* b
%Mat lab displays an error :
Matrix dimensions must agree.
```

4)

```
%All matrices have been set and the matrix operations where performed
A = [26.6,30.2;3100,6400;240,340]
b = [162;23611;1566]
pinv(A)
ans =
    0.0021  -0.0007  0.0130
   -0.0010   0.0005  -0.0063
x = A'*b
= 1.0e+08 *
    0.7357
    1.5165
```

5)

```
%Values where setup up as matrices and equations where performed to get x from Ax=b
A = [-11,6,5;6,-7,1;-5,-1,14]
b = [5.11;3.11;0]
x = A'*b
x =
   -37.5500
    8.8900
   28.6600
```

6)

```
%All matrices have been set up with the appropriate student number and the  
matrix operation and equation was performed
```

```
A = [Enter Your Student Number]
```

```
b = [5,6,3]
```

```
c = b*A*b'
```

```
c =
```

```
520
```

```
format bank
```

```
E = c/pi
```

```
E = 165.52
```

