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Table of Contents

Problem 1	1
Problem 2	1
Problem 3	1
Problem 4	2
Problem 5	2
Problem 6	2
Problem 7	3

Problem 1

```
A1 = [1 2 3; 0 4 5; 1 0 6];
sol1 = det(A1) * inv(A1) % Finding adjoint matrix
% adjoint(A1)
% ^^ Incorrect syntax as the function DNE, here as reminder for myself

sol1 =

    24    -12     -2
     5     3     -5
    -4     2      4
```

Problem 2

```
A2 = [1 2; 3 4];
ajdA2 = [4 -2; -3 1]; % Adjoint matrix
invA2 = ajdA2 / det(A2) % Finding inverse
inv(A2); % Check

invA2 =

   -2.0000    1.0000
    1.5000   -0.5000
```

Problem 3

```
A3 = A1;
cofA3 = [24 5 -4; -12 3 2; -2 -5 4]; % Cofactor matrix
adjA3 = [24 -12 -2; 5 3 -5; -4 2 4]; % Adjoint = Transposed cofactor
% adjA3 = [1 0 1; 2 4 0; 3 5 6]
% ^^ Incorrect calculation, here as a reminder for myself
```

```
invA3 = adjA3 / det(A3) % Finding inverse  
inv(A3); % Check
```

```
invA3 =
```

```
    1.0909    -0.5455    -0.0909  
    0.2273     0.1364    -0.2273  
   -0.1818     0.0909     0.1818
```

Problem 4

```
A4 = A2;  
I4 = eye(2); % Creating 2x2 identity matrix  
aug4 = [A4, I4]; % Concatenating A4 and I4  
rref4 = rref(aug4) % Finding inverse of A4 using RREF  
inv(A4); % Check
```

```
rref4 =
```

```
    1.0000         0   -2.0000     1.0000  
         0     1.0000     1.5000    -0.5000
```

Problem 5

```
A5 = [4 3; 3 2];  
invA5 = inv(A5); % Inverse matrix  
sol5 = A5 * invA5 % Showing equality  
invA5 * A5 % Showing equality
```

```
sol5 =
```

```
     1     0  
     0     1
```

```
ans =
```

```
     1     0  
     0     1
```

Problem 6

```
[z, a, y, b, x, c, w, d] = deal(0); % setting all variable letters = 0  
y = 10; % for part d later overwriting above  
c = 11; % for part d later overwriting above  
B6 = [z a 1 4; y b 2 3; x c 3 2; w d 4 1];
```

```
%{
part a: The diagonal elements of B are z [1, 1], b [2, 2], 3 [3, 3],
1 [4, 4]. The nondiagonal elements of B are the rest of the values in
the
matrix a, 1, 4, y, 2, 3, x, c, 2, w, d, and 4.
%}
B6T = transpose(B6) % part b: Transpose of B
B6TT = transpose(B6T) % part c: Transpose of B'
%{
part d:
B21 = y; in the transposed matrix, B', y is at B'(1, 2)
B32 = c; in the transposed matrix, B', c is at B'(2, 3)
B44 = 1, in the transposed matrix, B', 1 is at B'(4, 4), the same
position
The transposed matrix is a row and column exchangein
B(1, 3) becomes B'(3, 1) as the checks below would show
%}
B621 = B6(2, 1); % y in B
B6T12 = B6T(1, 2); % y in B'
B632 = B6(3, 2); % c in B
B6T23 = B6T(2, 3); % c in B'
B644 = B6(4, 4); % 1 in B
B6T44 = B6T(4, 4); % 1 in B'
```

$B6T =$

0	10	0	0
0	0	11	0
1	2	3	4
4	3	2	1

$B6TT =$

0	0	1	4
10	0	2	3
0	11	3	2
0	0	4	1

Problem 7

```
A7 = [ 3 2 0 2; 1 -1 0 4; 0 5 1 -1];
rrefA7 = rref(A7) % Finding rref of A7
%{
parametrix equation is:
x = [x1, x2, x3] = [2; -2; 9]
%}
```

$rrefA7 =$

1	0	0	2
---	---	---	---

0	1	0	-2
0	0	1	9

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