Computer Graphics Lab - CS352

Weekly Assignment Report

Objective Questions

Question 1:

Answer- A) Creates a vector of 5 equally spaced points between 1 and 10.

Question 2:

Answer- B) A .* B

Question 3:

Answer- B) The solution to the linear system A×C=B.

Question 4:

Answer- B) unique(v)

Question 5:

Answer- B) Equal to 3

Coding Questions

Unset

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% Question 1: Vector Creation and Operations

v = 1:2:20; % Vector from 1 to 20 with increment of 2

squares = v.^2; % Square of each element

evens = v(mod(v,2) == 0); % Extract even numbers


disp('Question 1: Squares of elements:'); disp(squares);

disp('Question 1: Even numbers:'); disp(evens);


% Question 2: Matrix Manipulations

A = randi(10, 3, 3); % 3x3 matrix with random integers

det_A = det(A); % Determinant

transpose_A = A'; % Transpose


disp('Question 2: Determinant of A:'); disp(det_A);

disp('Question 2: Transpose of A:'); disp(transpose_A);


% Question 3: Solving Linear Equations

coeffs = [2, 1, 1; 1, -1, 1; 1, 1, 1];

constants = [5; 2; 4];

solution = coeffs \ constants;
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% Display results for Question 3
disp('Question 3: Solution of the system:'); disp(solution);

% Question 4: Conditional Statements
n = input('Question 4: Enter a number: ');
if n > 0
    disp('Question 4: Positive number');
elseif n < 0
    disp('Question 4: Negative number');
else
    disp('Question 4: Zero');
end

% Question 5: Polynomial Operations
p = [3, 2, 0]; % Represented as a vector
derivative_p = polyder(p); % Derivative
value_at_5 = polyval(p, 5); % Value at x = 5

% Display results for Question 5
disp('Question 5: Derivative of the polynomial:'); disp(derivative_p);
disp('Question 5: Value at x = 5:'); disp(value_at_5);

% Question 6: 2D Plotting
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x = -2*pi:0.01:2*pi;

figure;

plot(x, sin(x), 'r--', 'LineWidth', 2); % Sine plot

hold on;

plot(x, cos(x), 'b-', 'LineWidth', 2); % Cosine plot


% Adding legend, title, and labels for Question 6

legend('sin(x)', 'cos(x)');

title('Question 6: Sine and Cosine Functions');

xlabel('x-axis');

ylabel('y-axis');

hold off;


% Question 7: Individual Plots


% Plot 1

figure;

plot(x, sin(2*x));

title('Question 7: y = sin(2x)');


% Plot 2

figure;

plot(x, cos(2*x));
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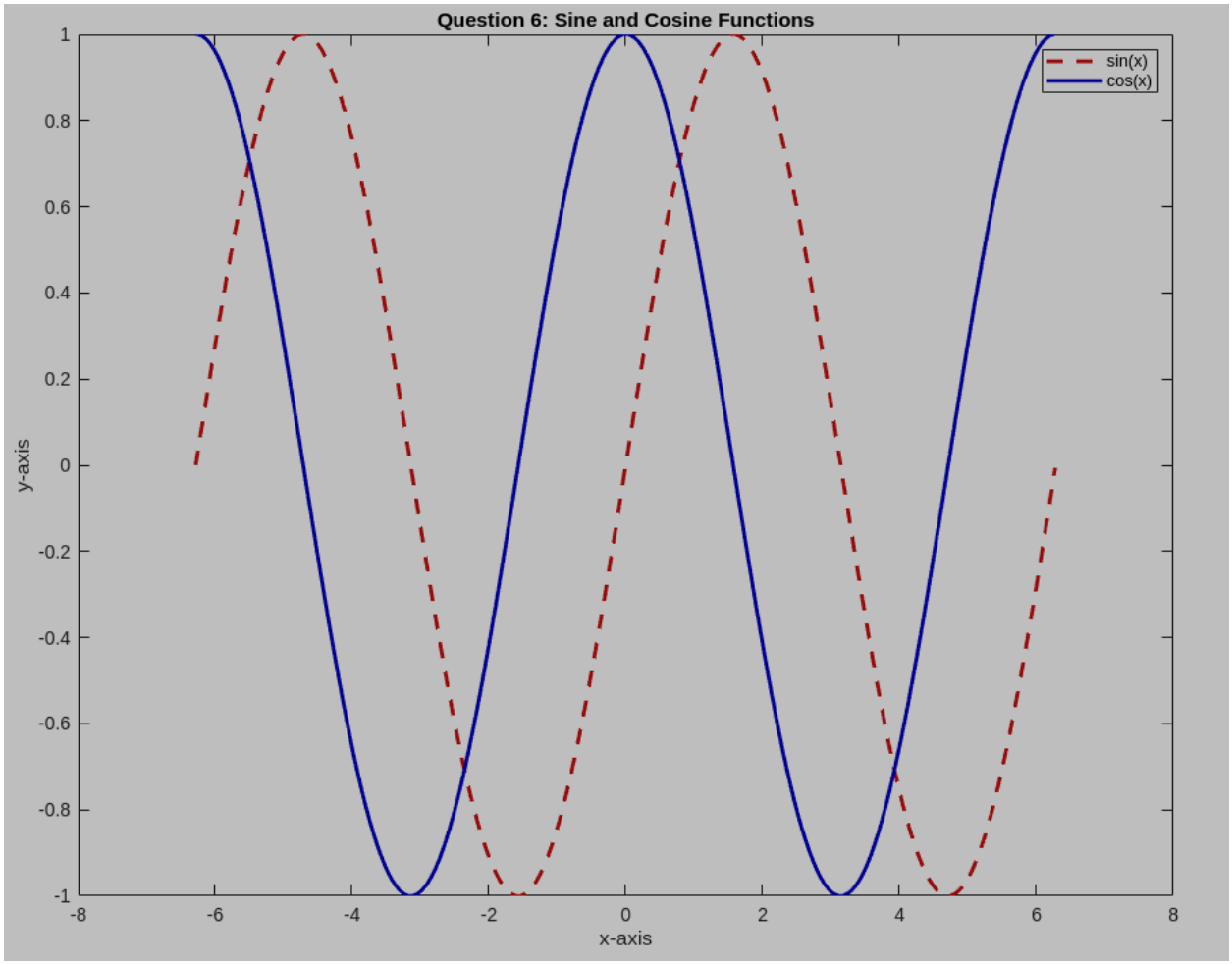
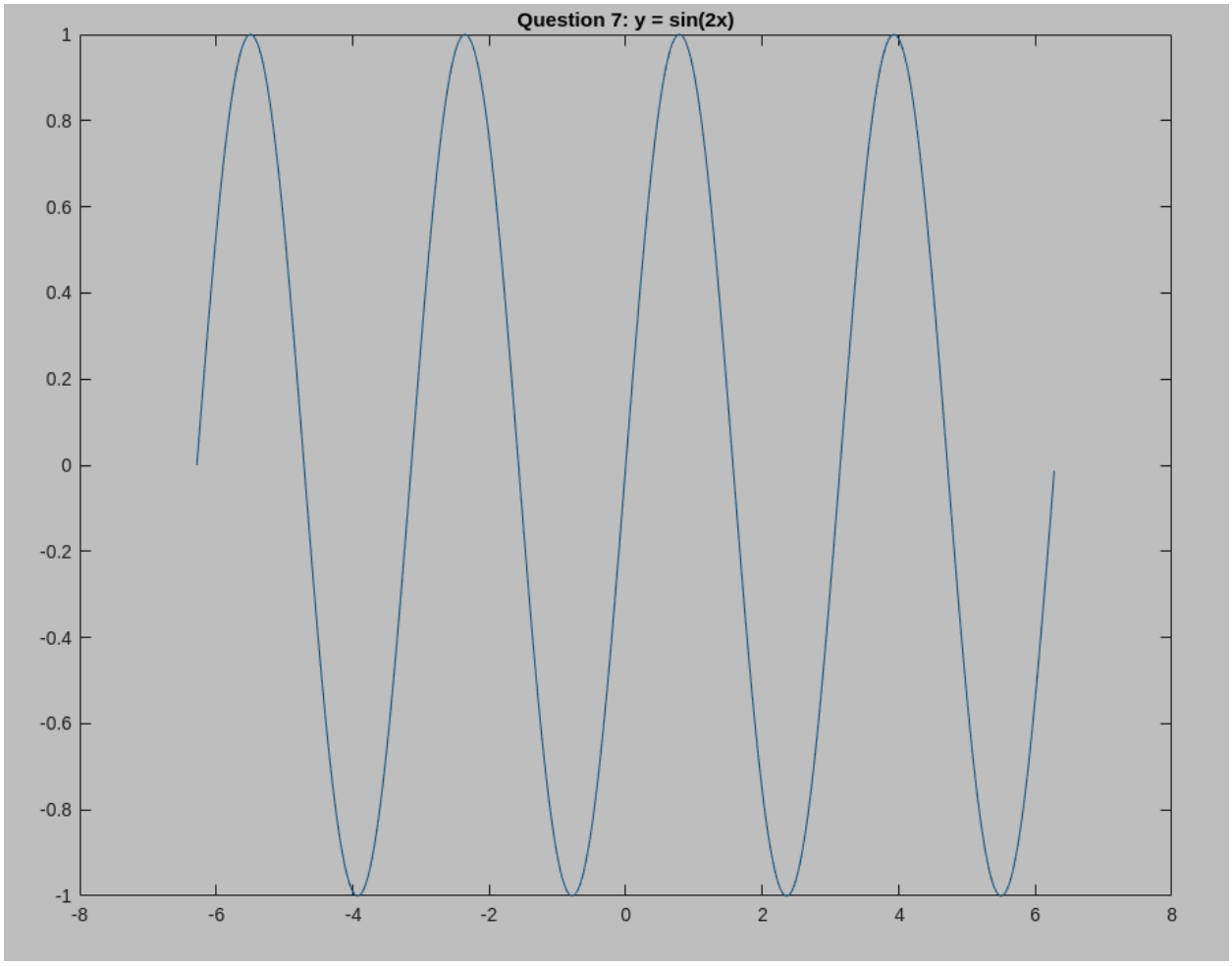
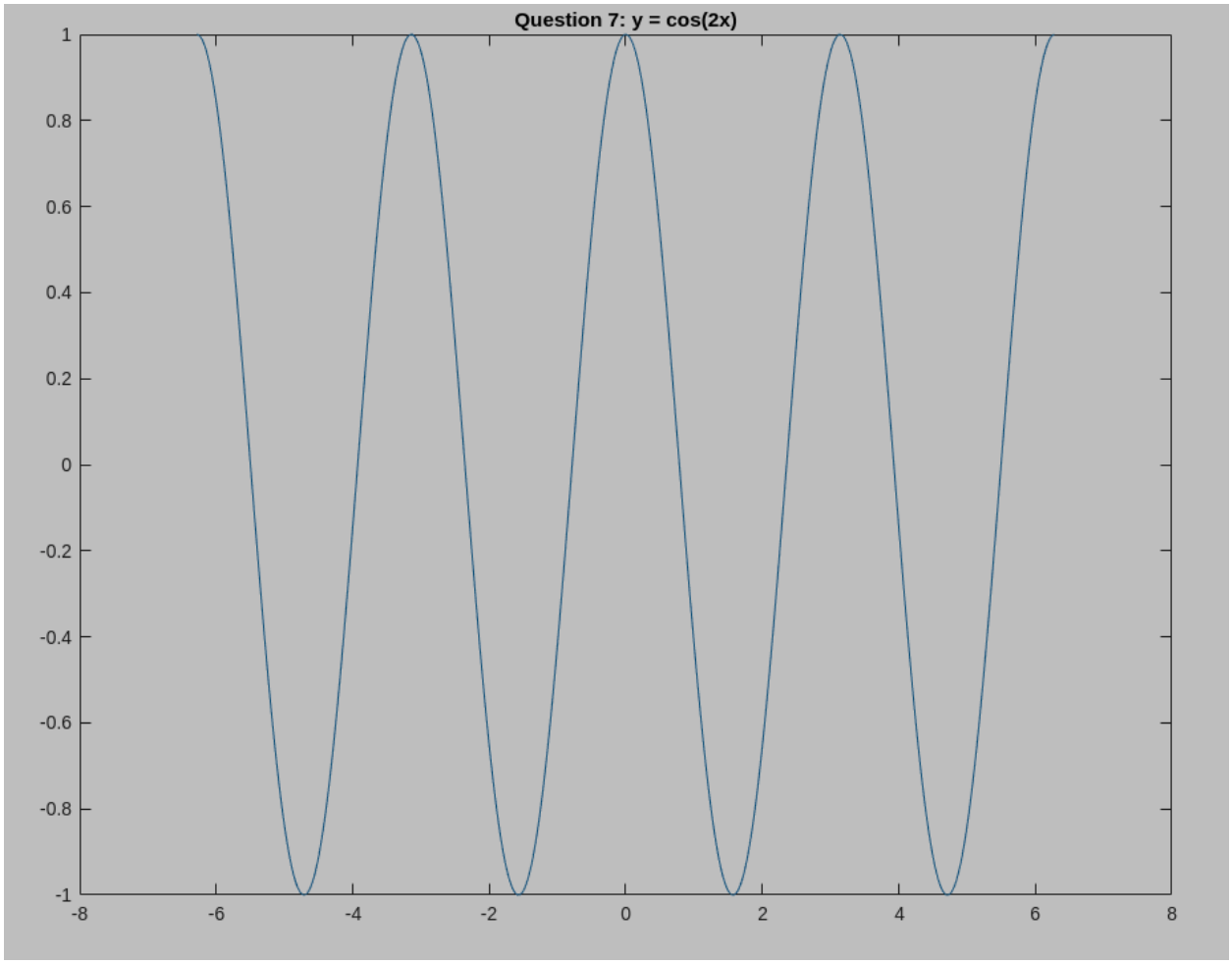
```
title('Question 7: y = cos(2x)');


% Plot 3
figure;
plot(x, tan(2*x));
title('Question 7: y = tan(2x)');


% Plot 4
figure;
t = linspace(0, 2*pi, 100);
plot(sin(t), cos(t));
title('Question 7: Parametric Plot: x = sin(t), y = cos(t)');
```

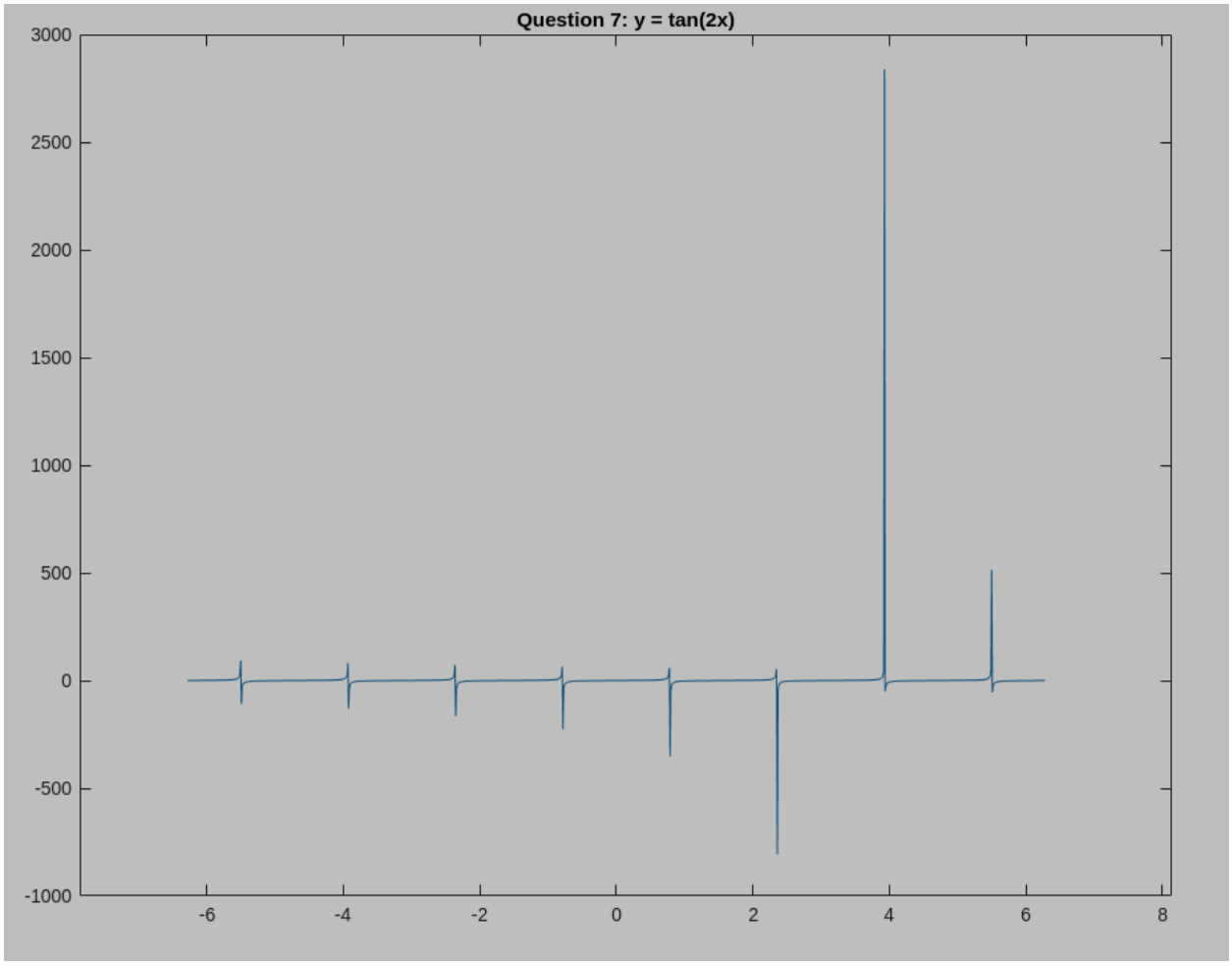
Output:

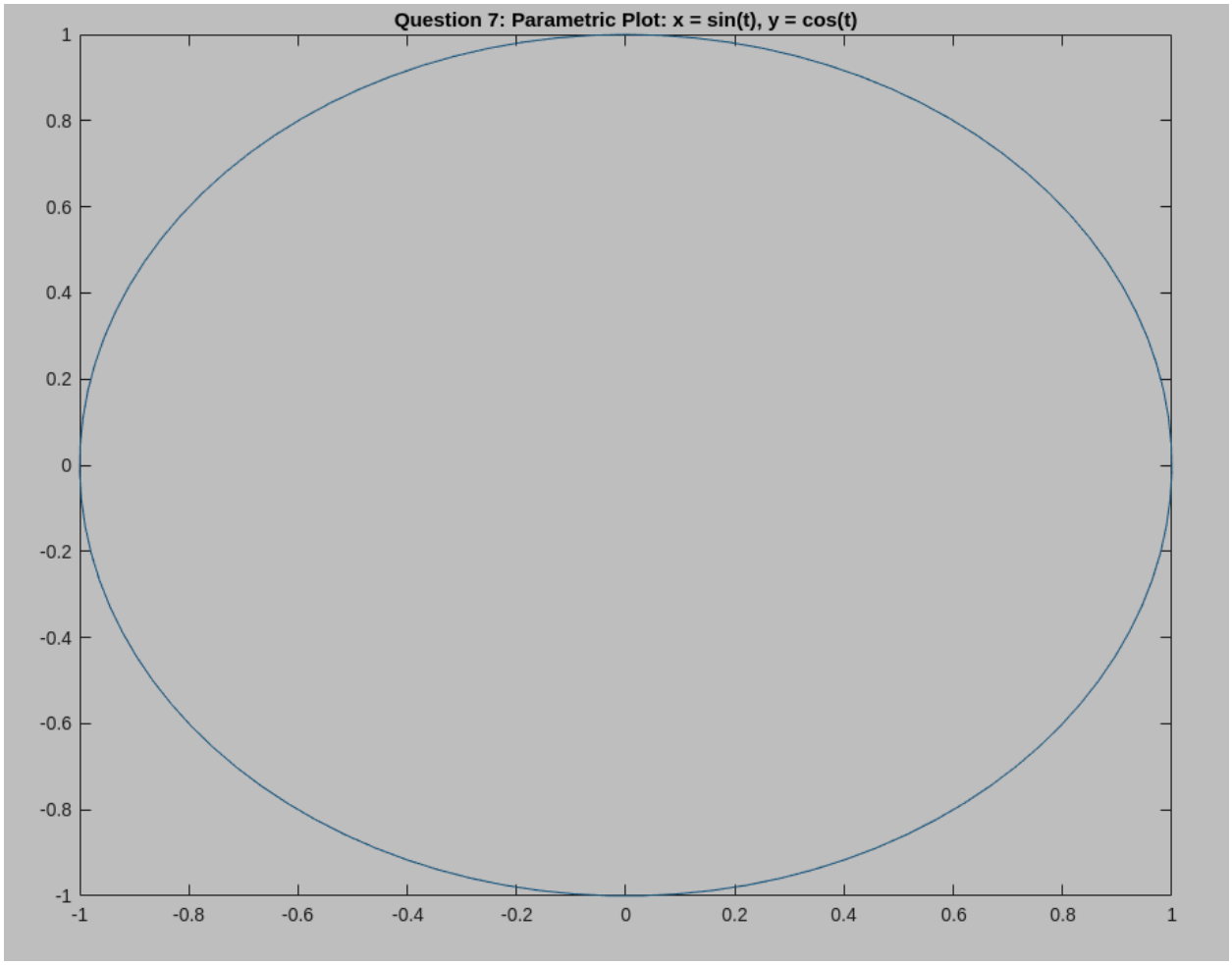
```
Question 1: Squares of elements:
     1     9    25    49    81   121   169   225   289   361

Question 1: Even numbers:
Question 2: Determinant of A:
  -306

Question 2: Transpose of A:
     2     5    10
     4     6     3
     8     3     6

Question 3: Solution of the system:
     1
     1
     2

Question 4: Enter a number:
10
Question 4: Positive number
Question 5: Derivative of the polynomial:
     6     2

Question 5: Value at x = 5:
    85
```


Question 6: Sine and Cosine Functions
sin(x)
cos(x)
y-axis
x-axis
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-8
-6
-4
-2
0
2
4
6
8


Question 7: y = sin(2x)
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-8
-6
-4
-2
0
2
4
6
8


Question 7: y = cos(2x)
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-8
-6
-4
-2
0
2
4
6
8


Question 7: y = tan(2x)
3000
2500
2000
1500
1000
500
0
-500
-1000
-6
-4
-2
0
2
4
6
8


Question 7: Parametric Plot: x = sin(t), y = cos(t)
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1