```
clc;
clear;

% Display instructions for input format
disp('Please enter the matrix in the following format:');
```

```
Please enter the matrix in the following format:
```

```
disp('Example 1: For a 2x2 matrix, enter [1 2; 3 4]');
```

```
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```

```
disp('Example 2: For a 3x3 matrix, enter [2 1 -1; -3 -1 2; -2 1 2]');
```

```
Example 2: For a 3x3 matrix, enter [2 1 -1; -3 -1 2; -2 1 2]
```

```

% Prompt user for matrix input
A = input('Enter the square matrix: ');

% Check if the input is a square matrix
[s, t] = size(A);
if s ~= t
    error("Matrix must be square to calculate RREF and determinant.");
end

% Calculate and display the determinant
determinant = det(A);
fprintf("The determinant is: %f\n", determinant);
```

```
The determinant is: -1.000000
```

```

% Perform row reduction to reduced row echelon form (RREF)
for idx = 1:s
    if A(idx, idx) == 0
        error("Pivot element is zero. Cannot proceed with RREF.");
    end
    % Normalize the pivot row
    A(idx, :) = A(idx, :) / A(idx, idx);
    for jdx = 1:s
        if jdx ~= idx
            % Eliminate other rows
            A(jdx, :) = A(jdx, :) - A(idx, :) * A(jdx, idx);
        end
    end
end

% Display the RREF
disp('The reduced row echelon form (RREF) is:');
```

```
The reduced row echelon form (RREF) is:
```

```
disp(A);
```

```
     1     0     0
     0     1     0
     0     0     1
```

```
% Display solutions
fprintf('Solutions (if applicable):\n');
```

```
Solutions (if applicable):
```

```
for k = 1:s
    fprintf("x(%d) = All Real Numbers\n", k);
end
```

```
x(1) = All Real Numbers
x(2) = All Real Numbers
x(3) = All Real Numbers
```