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QUESTION 1:

```
% Function is at the bottom in the supporting code section
% function out = f(theta)

% Testing theta = pi/4
val1 = f(pi/4);

% Testing theta = -pi/4
val2 = f(-pi/4);

fprintf('f(pi/4) = %.10f\n', val1);
fprintf('f(-pi/4) = %.10f\n', val2);

% Both are close to 0, so we are good
```

ALL FUNCTIONS SUPPORTING THIS CODE

First f(theta) function

```
function out = f(theta)

    % Platform lengths
    L1 = 2;
    L2 = sqrt(2);
    L3 = sqrt(2);

    % Angle across from L1
    gamma = pi / 2;

    % Strut lengths
    p1 = sqrt(5);
    p2 = sqrt(5);
    p3 = sqrt(5);

    % Strut base positions
    % Got these from Figure 1.15
    x1 = 4;
    x2 = 0;
    y2 = 4;

    A2 = L3 * cos(theta) - x1;
    B2 = L3 * sin(theta);
    A3 = L2 * (cos(theta) * cos(gamma) - sin(theta) * sin(gamma)) - x2;
    B3 = L2 * (cos(theta) * sin(gamma) + sin(theta) * cos(gamma)) - y2;
```

```

    N1 = B3 .* (p2^2 - p1^2 - A2.^2 - B2.^2) - B2 .* (p3^2 - p1^2 - A3.^2 -
B3.^2);
    N2 = -A3 .* (p2^2 - p1^2 - A2.^2 - B2.^2) + A2 .* (p3^2 - p1^2 - A3.^2 -
B3.^2);

    D = 2 * (A2 .* B3 - B2 .* A3);

    out = N1.^2 + N2.^2 - p1.^2 * D.^2;

end

f(pi/4) = -0.0000000000
f(-pi/4) = -0.0000000000

```

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