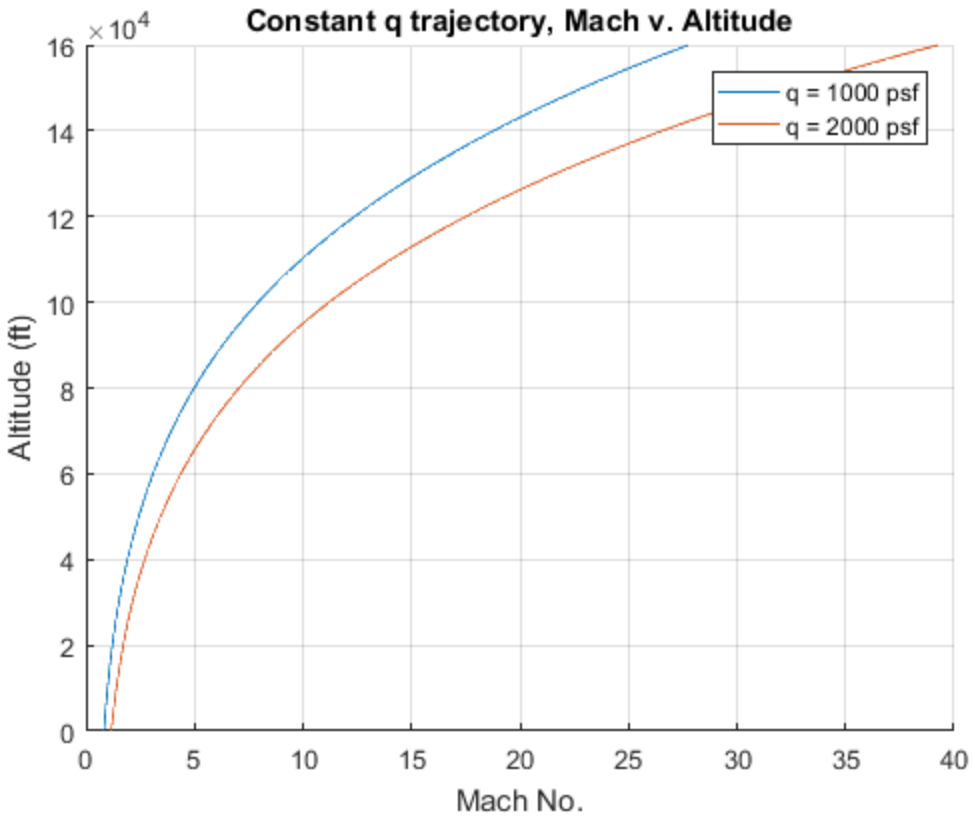
```
% Thomas Satterly
% AAE 537, HW1
% Problem 2

clc;
close all;
clear all;

import aae537.hw1.*;
q = [1000, 2000]; % psf

A = linspace(0, 160e3, 500); % Altitude (ft)
for i = 1:numel(A)
    for j = 1:numel(q)
        M(j, i) = calcMachAtQAndAlt(q(j), A(i));
    end
end

figure;
hold on;
plot(M(1, :), A);
plot(M(2, :), A);
legend('q = 1000 psf', 'q = 2000 psf');
xlabel('Mach No.');
ylabel('Altitude (ft)');
grid on;
title('Constant q trajectory, Mach v. Altitude');
```



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```
function M = calcMachAtQAndAlt(q, altitude)
% Thomas Satterly

gamma = 1.4;
[~, p, ~, ~] = aae537.hw1.atmosphere(altitude, 0);% Rankine, slug/ft^3
M = sqrt(2 * q / (gamma * p)); % Mach

end
```

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