```
function error = freqEq1Mod(omega)

% This function returns the error in the equation
% satisfied by the frequencies of a string with one end
% flexibly attached.  The scaled attachment flexibility k
% is assumed to be 1.
%
% Input:
%     omega: the frequency to test
% Output:
%     error: zero if omega is a correct frequency (tone)
%            of the string, nonzero if it is not.
%
% Advanced analysis taught in Analysis in Mechanical
% Engineering II shows that the equation the frequencies
% must satisfy is:
%                - k omega = tan(omega)
% However, the tan is infinite at any odd amount of pi/2,
% and that is a numerical problem.  So we multiply both
% sides by the cosine:
%             - k omega cos(omega) = sin(omega)
% Then if the frequency is not right, the error in the
% equation (difference between the right and left hand
% sides) is:
%          error = sin(omega) + k omega cos(omega)

% Note that omega is in radians and do not forget the semi-colon
error = sin(omega) + omega*cos(omega);

end
```