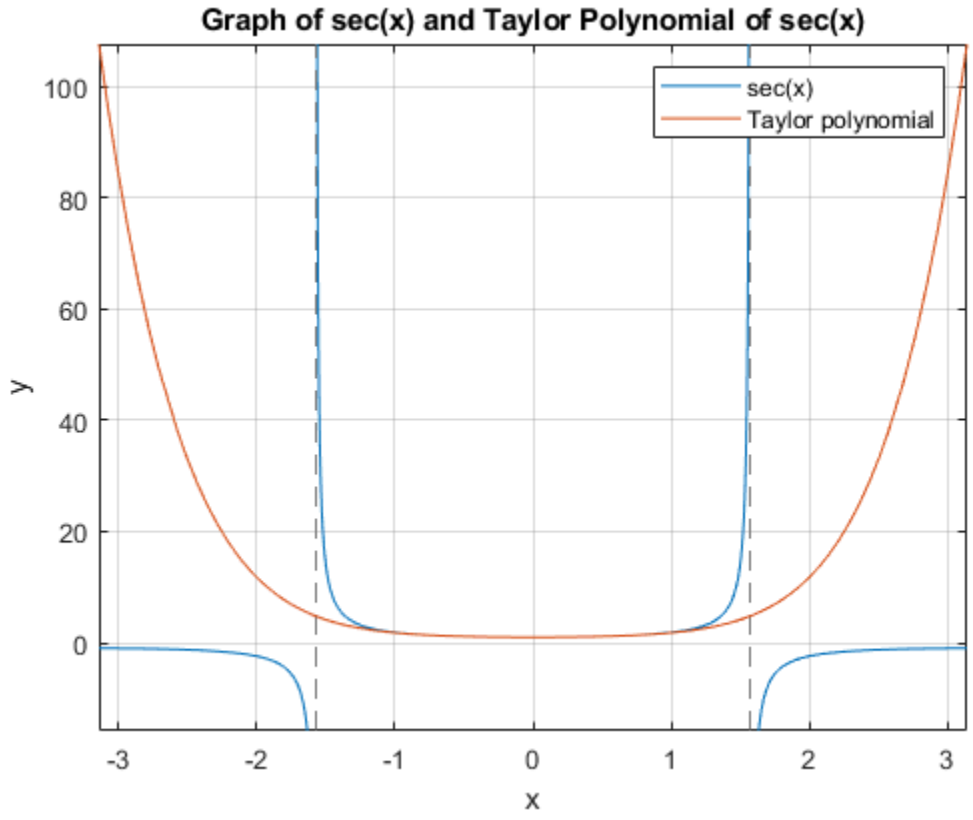
```
clc
clear
close all
format long g

%display name and assignment details
disp('Zyad Khan - MATLAB Chapter 11 Assignment')

syms x
f(x) = sec(x);
Taylor = taylor(f(x),'order',8);

disp(['The Taylor polynomial for sec(x) is f(x)=' char(Taylor)])

% Graph f(x) and the Taylor polynomial on the interval [-pi,pi]
fplot(f(x), [-pi,pi]);
grid on; hold on;
fplot(Taylor, [-pi,pi])
title('Graph of sec(x) and Taylor Polynomial of sec(x)')
legend('sec(x)', 'Taylor polynomial')
xlabel('x')
ylabel('y')

% Absolute error between sec x and Taylor polynomial of sec(x)) at
 x=pi/3
fp3 = subs(f(x),(pi/3));
pp3 = subs(Taylor,(pi/3));


absolute_error1 = abs(fp3-pp3);
fprintf('The absolute error between sec x and the taylor polynomial
 with the degree of 7 at pi/3 is %.5f.\n', absolute_error1)

% Absolute error between sec x and Taylor polynomial of sec(x)) at
 x=pi/6
fp6 = subs(f(x),(pi/6));
pp6 = subs(Taylor,(pi/6));

absolute_error2 = abs(fp6-pp6);
fprintf('The absolute error between sec x and the taylor polynomial
 with the degree of 7 at pi/6 is %.5f.\n', absolute_error2)

% if-else statement

if absolute_error1 < 0.01
    fprintf('The Taylor polynomial approximation is good when x is
 near pi/3.\n')
else
    fprintf('The Taylor polynomial approximation is poor when x is
 near pi/3.\n')
end
```

```
if absolute_error2 < 0.01
    fprintf('The Taylor polynomial approximation is good when x is
 near pi/6.\n')
else
    fprintf('The Taylor polynomial approximation is poor when x is
 near pi/6.\n')
end
```

```
Zyad Khan - MATLAB Chapter 11 Assignment
The Taylor polynomial for sec(x) is f(x)=x^2/2 + (5*x^4)/24 +
 (61*x^6)/720 + 1
The absolute error between sec x and the taylor polynomial with the
 degree of 7 at pi/3 is 0.08942.
The absolute error between sec x and the taylor polynomial with the
 degree of 7 at pi/6 is 0.00022.
The Taylor polynomial approximation is poor when x is near pi/3.
The Taylor polynomial approximation is good when x is near pi/6.
```



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