

```
1 % Aidan Chin
2 % 12/10/23
3 % ECE 202: Project 1 phase 2
4
5 %---initialize---
6
7 format shortG
8 clear
9 clc
10
11 %---setup---
12
13 t = linspace(0,0.5,1000); % make time array t in seconds from 0s to 0.5s
14
15 n = [0:2:10] % n values of non-zero coefficients
16 a_n = (-1).^(n/2).*(20.^n)*7./factorial(n) % a_n values of non-zero coefficients
17
18 % ---- calculations ----
19
20 f1 = a_n(1)*t.^n(1); % First term
21 f2 = f1 + a_n(2)*t.^n(2); % 1-2 term
22 f3 = f2 + a_n(3)*t.^n(3); % 1-3 terms
23 f4 = f3 + a_n(4)*t.^n(4); % 1-4 terms
24 f5 = f4 + a_n(5)*t.^n(5); % 1-5 terms
25 f6 = f5 + a_n(6)*t.^n(6); % 1-6 terms
26
27 % ---- plotting ----
28
29
30 %plot values
31 p1 = plot(t,f1,t,f2,t,f3,t,f4,t,f5,t,f6);
32
33 grid on %turn on gridlines
34
35 title({"ECE 202 Project 1 Phase 1: Power series expansion", ...
36       "of f(t)=7cos(20t) up to first 6 non-zero terms"})
37 %make title
38 xlabel("Time (t) in milliseconds")
39 %add title for x
40 ylabel("First six non-zero terms of f(t)=7cos(20t)")
41 %add title for y
42 ylim([-10 10])
43 %change bounds
44
```