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```
% CPE 3103 - FUNDAMENTALS OF MIXED SIGNALS AND SENSORS
% Group 1   MW 10:30 AM - 1:30 PM LBCEAC2 TC
% Sarcol, Joshua S      BS-CpE 3        2025/09/03
% Laboratory Exercise 1.a

clc
clear
```

1a

```
A = [2 1 1;
     0 -3 4];

B = [3 -1 3;
     2 0 5];
no1a = A - B
```

```
no1a =

    -1     2    -2
    -2    -3    -1
```

1b

```
A = [1 2;
     3 0];

B = [1 3;
    0 -4];

no1b = 3 * A - 2 * B
```

```
no1b =

     1     0
     9     8
```

1c

```
A = [2 1 1;
     0 -3 4];

B = [3 -1 3;
     2 0 5];

no1c = 5 * A - 2 * B


no1c =

     4     7    -1
    -4   -15    10
```

2

```
A = [1 2;
     3 0];

B = [2 -1;
     3 4];

C = [2 -2;
     1 3;
     4 -1];

no2 = C * (A + B)


no2 =

    -6    -6
    21    13
     6     0
```

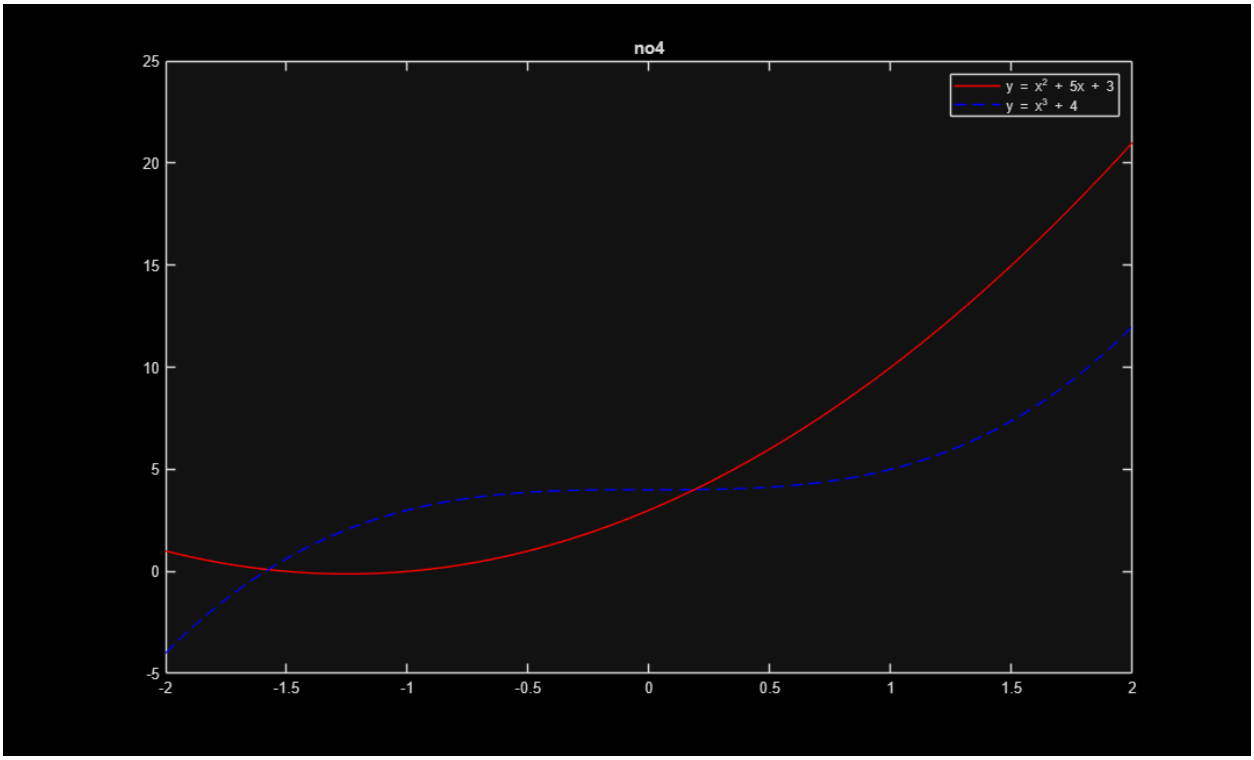
3

```
no3 = C * A + C * B


no3 =
```

```
    -6    -6
    21    13
     6     0
```

4

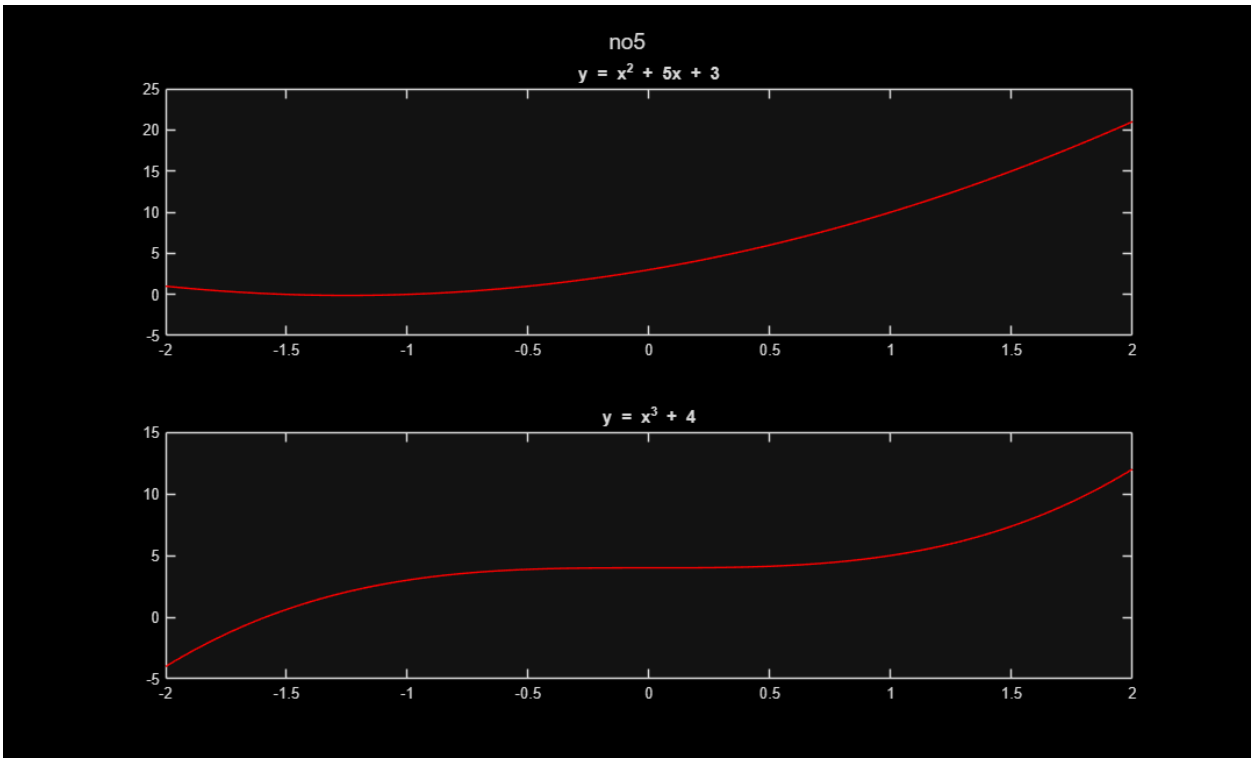
```
x = -2:0.01:2;
a = polyval([2 5 3], x);
b = polyval([1 0 0 4], x);

figure(1)
plot(x, a, "r")
hold on
plot(x, b, "b--")
legend(["y = x^2 + 5x + 3" "y = x^3 + 4"])
title("no4")
hold off
```



5

```
figure(2)
subplot(2, 1, 1)
plot(x, a, "r")
title("y = x^2 + 5x + 3")

subplot(2, 1, 2)
```

```
plot(x, b, "r")
title("y = x^3 + 4")

sgtitle("no5")
```



6a

```
p1 = [1 32 8 85 4 1 3 1];
no6a = roots(p1)
```

```
no6a =

 -31.8324 + 0.0000i
  -0.0669 + 1.6287i
  -0.0669 - 1.6287i
   0.2275 + 0.3069i
   0.2275 - 0.3069i
  -0.2444 + 0.1458i
  -0.2444 - 0.1458i
```

6b

```
p2 = [3 -1 24 9 6 2];
no6b = roots(p2)
```

```
no6b =
```

```
   0.3600 + 2.8093i
   0.3600 - 2.8093i
  -0.0216 + 0.4914i
  -0.0216 - 0.4914i
  -0.3435 + 0.0000i
```

6c

```
p3 = [1 77 11 1];
no6c = roots(p3)
```

```
no6c =

 -76.8570 + 0.0000i
  -0.0715 + 0.0889i
  -0.0715 - 0.0889i
```

7a

```
no7a = conv(p1, p2)
```

```
no7a =

  Columns 1 through 6

           3          95          16        1024         413        2305

  Columns 7 through 12

         981         586         274          65          29          12

  Column 13

           2
```

7b

```
no7b = conv(p1, p3)
```

```
no7b =

  Columns 1 through 6

           1         109        2483        1054        6669        1252
```

```
  Columns 7 through 11

        209         247         111          14           1
```

7c

```
no7c = conv(p2, p3)

no7c =

  Columns 1 through 6

           3         230         -20        1849         962         587

  Columns 7 through 9

         229          28           2
```

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