الاسم: ....   رقم القيد: ....   المجموعة: ....

Q: (8 Marks) Solve the following Mathematical expressions using MATLAB:

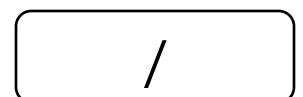| Mathematical Expression	MATLAB Code

$\dfrac{d^2}{dt^2}\,\dfrac{\sqrt{2x^2-t}}{2x^2-t}$	```>> syms x```
	```>> diff(sqrt(2*x^2-1)/(2*x^2-1),2)```
	```ans =```
	```(12*x^2)/(2*x^2 - 1)^(5/2) - 2/(2*x^2 - 1)^(3/2)```

$\displaystyle\int \dfrac{dx}{1+e^{2x}}$	```>> syms x```
	```>> int(1/(1 + exp(2*x)) , x)```
	```ans =```
	```x - log(exp(2*x) + 1)/2```

$\displaystyle\int_{-1}^{1} \dfrac{x+1}{(x+2)^4}\,dx$	```syms x, int((x+1)/(x+2)^4,-1,1)```
	```ans =```
	```10/81```

$G = \displaystyle\sum_{n=1}^{100} \dfrac{2n+1}{n^2}$	```n = 1:100;```
	```G = sum((2*n + 1)./n.^2)```
	```G =```
	```12.0097```

/

CAD Practical Midterm Exam 20%

Spring 2022   **Time: 40 minutes**

الاسم: .... رقم القيد: .... المجموعة: ....

Q: **(6 Marks)** Write a MATLAB code to get the following Figure:
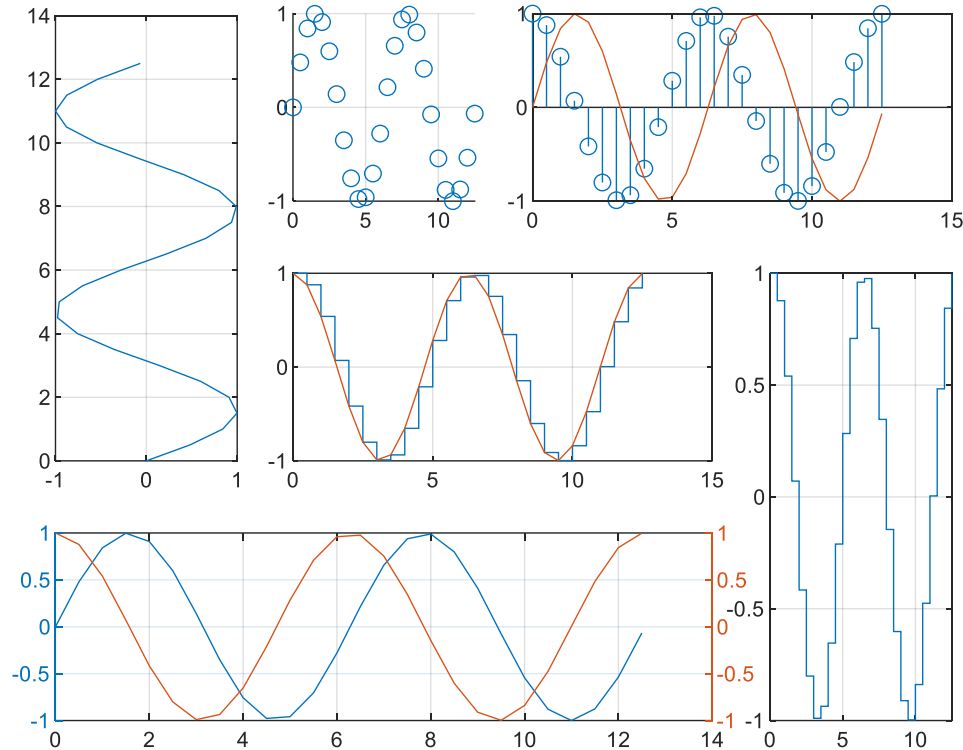

```
clear; close all; clc; t = 0:0.5:4*pi;


subplot(3,4,[1 5]) ;  plot(sin(t),t), grid on

subplot(3,4,2)      ;  scatter(t,sin(t)), grid on

subplot(3,4,3:4)    ;  stem(t,cos(t)), hold on, plot(t,sin(t)), grid on

subplot(3,4,6:7)    ;  stairs(t,cos(t)), hold on, plot(t,cos(t)), grid on

subplot(3,4,[8 12]);  stairs(t,cos(t)), grid on

subplot(3,4,9:11)   ;  plotyy(t,sin(t),t,cos(t)), grid on
```

/

CAD Practical Midterm Exam 20%

Spring 2022   **Time: 40 minutes**

الاسم: ....   رقم القيد: ....   المجموعة: ....

Q: **(6 Marks)** Solve the following Algebraic Equations using MATLAB, *your answer must be in decimal form*:

$2x - 2z = 3 - y$ $\qquad\qquad$ $\rightarrow$	$2x + y - 2z = 3$
$-y = z - x$	$x - y - z = 0$
$x + y = 12 - 3z$	$x + y + 3z = 12$

```
A = [2 1 -2; 1 -1 -1; 1 1 3]; b = [3 ; 0 ; 12];
>> linsolve(A,b)
ans =
    3.5000
    1.0000
    2.5000
```

$$ln(x - 2) + ln(2x - 3) = 2 lnx + 2$$

```
>> syms x
>> solve( log(x-2) + log(2*x-3) - 2*log(x) - 2 )
ans =
-1/((24*exp(2) + 1)^(1/2)/12 - 7/12)
```

Best of luck

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