

# MAT 330: Differential Equations

## Module One Template

Complete this template by replacing the bracketed text with the relevant information.

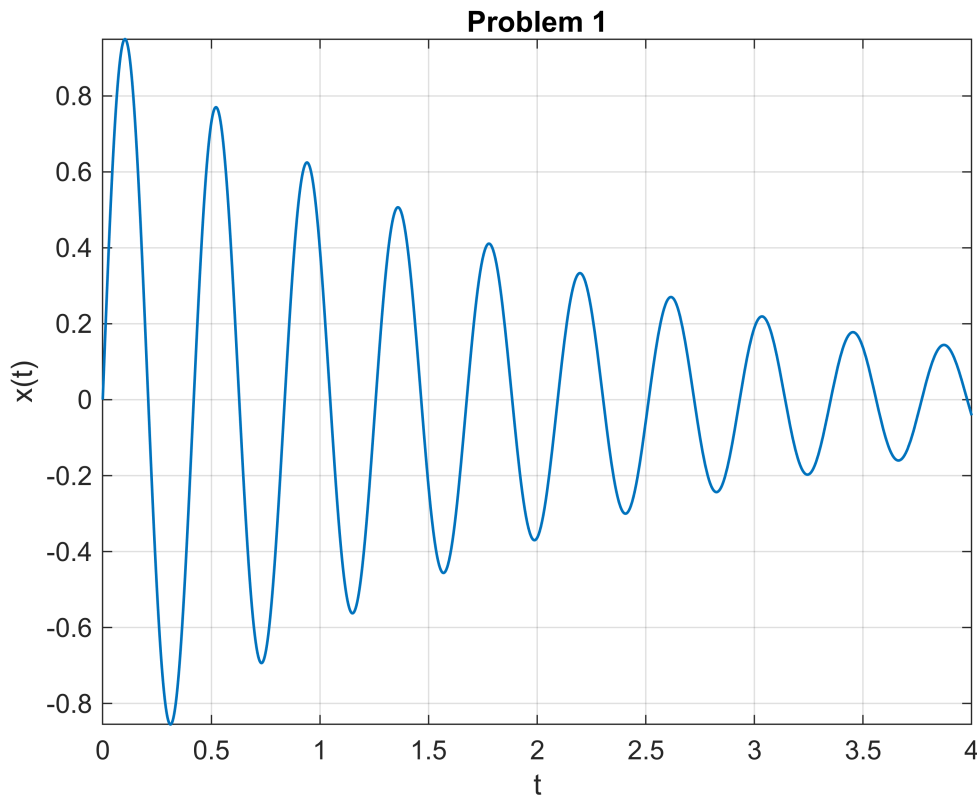
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### Problems:

**Problem 1:** Use MATLAB to plot the function  $y_1(t) = e^{-0.5t} \sin(15t)$  for  $t = 0$  to 4. Plot the function as a solid line and turn the plotting grid on. Make sure to label both axes and title your figure.

```
%[Insert your MATLAB code and plot here.]  
syms t A C;  
  
A = -0.5;  
C = 15;  
  
x(t) = (exp(A*t)) * sin(C*t);  
  
figure;  
  
fplot(x(t),[0,4], '-', 'linewidth',1);  
xlabel('t');  
ylabel('x(t)');  
title('Problem 1');  
grid on;
```



**Problem 2: Use MATLAB to plot the functions  $z_1(t) = e^t$ ,  $z_2(t) = 2u(t + 1)$ , and  $z_3(t) = 0.5 \sin(7t)$  for  $t = -2$  to  $2$ . Plot  $z_1(t)$  function as a solid line,  $z_2(t)$  as a dotted line, and  $z_3(t)$  as a dashed line, and turn the plotting grid on. Make sure to label both axes, title your figure, and turn on the plotting legend. Set the y-axis limits to  $[-1 \ 8]$ .**

```
%[Insert your MATLAB code and plot here.]
syms t u A B C;
A = 2;
B = 0.5;
C = 7;

z(t) = exp(t);
z2(t) = A*heaviside(t+1);
z3(t) = B*sin(C*t);

figure;
fplot(z(t),[-2,2],'-','linewidth',2);
hold on;
fplot(z2(t),[-2,2],':','linewidth',2);
fplot(z3(t),[-2,2], '--','linewidth',2);
grid on;
xlabel('t');
ylabel('Various Functions');
title('Problem 2');
```

```
ylim([-1 8]);  
legend;
```

