Contents


```
%Joel Lubinitsky
%MAE 321 - HW 1
%01/21/15

clear all
close all
clc
```

Given

```
frequencyNaturalRad = 3;       %rad/s
xInitial            = 1.2;     %mm
velocityInitial     = sqrt(3); %mm/s
```

Conversions

```
xInitial        = xInitial / 1000;        %m
velocityInitial = velocityInitial / 1000; %m/s
```

Calculations

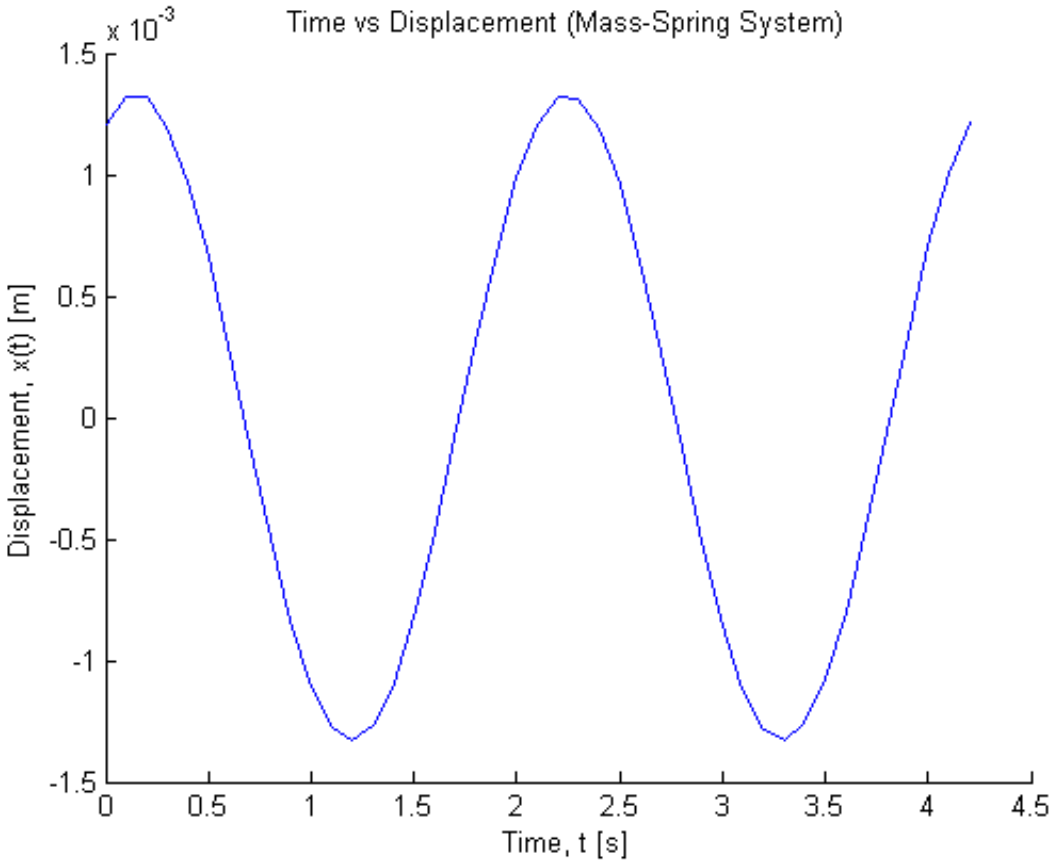
```
frequencyNaturalHz = frequencyNaturalRad / (2 * pi); %Hz
periodNatural      = 1 / frequencyNaturalHz;         %s

dt        = 0.1;                    %s
timeTotal = 2 * periodNatural + dt; %s
time      = [0 : dt : timeTotal];   %s

x = xInitial .* cos(frequencyNaturalRad .* time) + (velocityInitial ./ frequencyNaturalRad) .* sin(
frequencyNaturalRad .* time); %m
```

Plot

```
figure(1)
hold on
title('Time vs Displacement (Mass-Spring System)')
xlabel('Time, t [s]')
ylabel('Displacement, x(t) [m]')
plot(time, x)
```



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