Sheet # 1

1- On the same figure plot the two functions x , y.
Where, x = Cos (2 π 50t)
        y = Sin (2 π 50t)
and t ranges from 0 to 2/50 with 1000 points.
Use the appropriate range for the x & y axes and label them as 'time' and 'amplitude' respectively.

2- Plot each of the following functions using the same ranges and labels of question 1 ,then verify your answer using the mathematical formulas listed below:

a- $Cos^2 (2 \pi 50t)$
b- $Sin^2 (2 \pi 50t)$
c- $Cos^3 (2 \pi 50t)$
d- Cos (2 π 50t) Cos(2 π 100t)
e- Sin (2 π 50t) Sin(2 π 100t)
f- Sin (2 π 100t) Cos(2 π 50t)

Mathematical Formulas:

$Cos^2 (\Theta) = 0.5 [1 + Cos (2\Theta)]$
$Sin^2 (\Theta) = 0.5 [1 - Cos (2\Theta)]$
$Cos^3 (\Theta) = \frac{3}{4} Cos (\Theta) + \frac{1}{4} Cos (3\Theta)$
$Cos(a) Cos(b) = 0.5 [Cos (a-b) + Cos (a+b)]$
$Sin(a) Sin(b) = 0.5 [Cos (a-b) - Cos (a+b)]$
$Sin(a) Cos(b) = 0.5 [Sin (a-b) + Sin (a+b)]$