MATLAB Exercise 8 – Graphics -Curve

1. Plot following 2-D curve

   1) $y = e^{-0.3x}\cos 2x, x \in [0,6]$;

   2) $x = 4\sin t, y = 4\cos t, t \in [0, 2\pi]$;

   3) $x^4 + y^4 - 8x^2 - 10y^2 + 16 = 0$;

   4) $\rho = 4\cos 3\theta$.

2. Let $y = \dfrac{nx}{1+x}, x \in [0,10]$.

   1) Set $n = 1,5,10$ respectively; display the corresponding curve c_1, c_2, c_3 at the same axes;

   2) Use different color to distinguish the curves;
   3) Legend the curves;
   4) Add grid on the figure above;
   5) Label the x-axis with 'X-轴' and y-axis with '函数值'.

3. Add title for 4) in Ex1 with 'Plot of $\rho = 4\cos 3\theta$'.

4. Let $x^4 + y^4 - 2(x^2 + y^2) = b$.

   1) Plot 4 figures c_1, c_2, c_3, c_4 with b=1.0, -0.7, -1.0, -1.05;

   2) Partition the figure into 4 subplots, plot c_1, c_2, c_3, c_4 into the subplots in turn.

5. Create 2 figures which plot the following 3-D curves, respectively.

   1) $x = 0.5t^2, y = 0.1t^3, z = 9\cos 2t, t \in [0,6]$;

   2) $x = 0.5\sin t, y = 0.1\cos t, z = 9\cos 2t, t \in [0,9]$.

6. Plot polylines(折线) with following data on the same axes. Distinguish them by color and line shape and legend them.

   1) $x = [0,1,4,5,7], y = [1,3,4,5,5.6]$; 2) $x = [1,2,3,4,5], y = [2,4,1,6,3]$.

7. Let $f(x) = \dfrac{1}{5 + 4\cos x}$, $f_1(x) = f'(x)$, $f_2(x) = f''(x)$, $g(x) = \int\int f_2(x) d^2x$.

   1) Plot $f(x), f_1(x), f_2(x)$ respectively;

   2) Observe the plots of $f(x)$ and $g(x)$ are the same? Break the Figure window into an 1-by-2 matrix of small axes, plot $f(x)$ and $g(x)$.
   3) Let e be the error between $f(x)$ and $g(x)$. Display the function e and plot it. What do you find out?

8. *Plot three circles with the same center in one figure.
9. *Plot a pentagram(五角星).