
You should hand in your script files. You only need to print out the graph from the first problem.

1) (6 pts)

a) Plot the parametric curve

$$x(t) = 2 \cos(t), y(t) = 3 \sin(t), t \in [0, 2\pi].$$

Do this by dividing the t interval into an equally spaced array, computing x and y at each value of t , then plotting x versus y . You should get a closed curve. If you don't, double check your plot command.

b) What is this figure called? Make sure that each axis has the same scaling.

c) Now plot the parametric curve

$$v(t) = 3 \cos(t), w(t) = 2 \sin(t), t \in [0, 2\pi]$$

on the same set of axes as the curve from part a).

d) The 2 curves should intersect at 4 points. Find the coordinates of these points accurate to 2 significant digits (can the symmetry of the problem be exploited?). To do this, click on the + magnifying glass (on the plot window toolbar) and zoom in on an intersection point. How can you be sure that you have found the required accuracy?

e) Use your answer from d) to plot a '*' at each of the intersection points.

f) Save this plot as a jpeg image file and print it out.

2) (3 pts) Plot the sine function on the interval $[0, 2\pi]$. You should use black open circles as the symbol markers. In areas where the sine is positive, you should connect the markers with a red line. In areas where the sine is negative, you should connect the markers with a blue line.

Change the interval to $[0, 4\pi]$. Does your script generate the correct plot?

3) (3 pts) Plot the following sequences of curves on the intervals indicated. All the graphs for each subpart should be on the same set of axes. Select a set of x points that is fine enough to capture all the features of the curves.

a) $\sin(x)$, $\sin(x + \frac{\pi}{4})$, $\sin(x + \frac{\pi}{2})$, $\sin(x + \frac{3\pi}{4})$, $\sin(x + \pi)$, $x \in [-2\pi, 2\pi]$.

b) $(x - 2)^2$, $(x - 1)^2$, x^2 , $(x + 1)^2$, $(x + 2)^2$, $x \in [-3, 3]$.

c) $x^2 - 2$, $x^2 - 1$, $x^2 + 1$, $x^2 + 2$, $x \in [-2, 2]$.

4) (4 pts) Repeat Problem 2c), but use the `subplot` command to put each figure in its own subplot window.