Name: _____ Section: _____

Exam1. Submit the script file on BlackBoard. Name it as you wish.
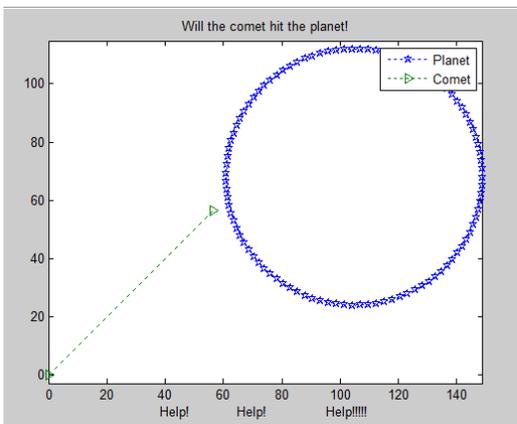
A little reality and a little science fiction....

A comet is aiming for a planet, but it will self-destruct by explosion after a known distance! To help out, the government hires you to create a program that will plot the planet **and** the comet path, so we can easily see if we are doomed or not!

The comet's path is a straight line that starts at the origin (0,0). The angle β (degrees) of the path, as well as its length are known.

The planet's radius is known, as well as its center coordinates (x_{center}, y_{center}) with respect to the origin. To plot a planet, the x and y data points can be calculated with the following equations:

$$x(\theta) = radius * \cos(\theta) + x_{center}$$
$$y(\theta) = radius * \sin(\theta) + y_{center}$$

Before applying these two equations, you should create a vector of θ with a lot of values from 0 to 2π.

Step1 (**5pts**):

Step2: Shown above.   Step3: Equation also given above.

Step4: Assume values from Test Case#1. Assume comet has no "thickness" (pure science fiction today! ☺)

Step5/Step6: Solve graphically. NO MATH (though it would be interesting!)

Step7a and 7b: place directly on the script file. There are no step 7c to show.

     Requirements for the program itself:

     (**12pts**) Hardcode a variable for each given.

     (**20pts**) Define all vectors necessary to plot the planet and the comet (5 vectors)

     (**10pts**) Plot correctly, using colors, markers and line specifications AS SHOWN in the videos. (+2 if you find the real star marker for the planet!)

     (**2pts**) Immediately below your plot() command, write the command: `axis equal;` (Exactly like that!)

     (**15pts**) Title, label the x axis (as shown) and legend the plot properly and fully

     (**5pts**) – other random errors I should not even dream of!

(5pts) – Fill in the table. The units are science-fiction, but there is no need for any kind of conversion today.

Test case	Comet: Path angle (degree)	Comet: Distance before explosion (km)	Planet radius (km)	Planet center (x,y coordinates) (kms)	Are we doomed or safe?
#1	40	82	44	(105, 68)	
#2	43.5	200	22	(105, 68)	
#3	32	2000	22	(1050, 680)	

Within script:

- o name/section/purpose of code (**3pts**)
- o commands to clean up previous execution of MATLAB codes (**3pts**)
- o comments (which is considered the algorithm 7a) (**5pts**)
- o spacing of code (**5pts**)
- o appropriate variable names (no single letters) (**5pts**)
- o semi-colon hiding calculations (**5pts**)