

To plot the polar curve  $r = 1 + 2\cos(\theta)$  do the following steps

1. label columns Theta, r, x, y as shown below (eg. Cells A1, B1, C1)

Theta	r	x	y
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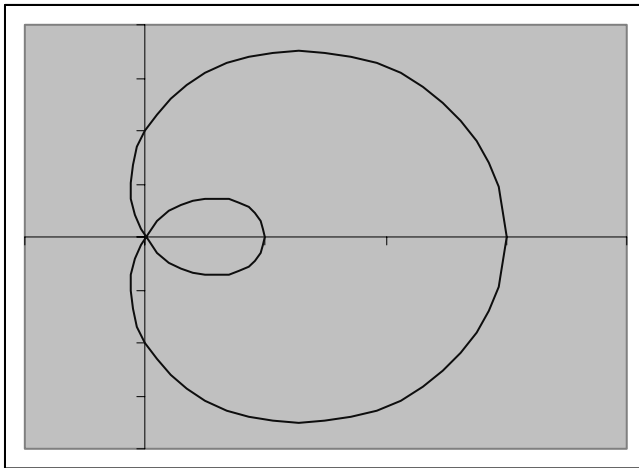
2. In the first cell below Theta (i.e., A2) insert the number 0
3. Select the next cell ( A3) and type the formula =A2+pi()/20. Note that you can insert A2 into the formula by clicking on that cell. Press Enter.
4. Select the cell A3 again and move the cursor to the small black box in the lower right corner. The cursor will change to the shape of a bold plus sign ( + ). Click with the left mouse button and drag to cell A42. This way you have created values for  $\theta$  in the range  $0 - 2\pi$  with a step of  $\pi/20$ .
5. Select cell B2 by clicking on it and enter the formula =1+2\*cos(A2). Press Enter.
6. Repeat the formula for cells B3-B42 similar to step 4 above. This way you have created the corresponding r values.
7. Select cell C2 and enter the formula =B2\*cos(A2). Press Enter. Repeat this formula for cells C3-C42 similar to step 4. This creates the x coordinates of the graph table.
8. Select cell D2 and enter the formula =B2\*sin(A2). Press Enter. Repeat this formula for cells D3-D42 similar to step 4. This creates the y coordinates of the graph table. After these steps your cells should look like this

Theta	r	x
0	3	3
0.15708	2.975377	2.938745
0.314159	2.902113	2.760074
0.471239	2.782013	2.478792
0.628319	2.618034	2.118034
0.785398	2.414214	1.707107
0.942478	2.175571	1.278768
1.099557	1.907981	0.866205
1.256637	1.618034	0.5
1.413717	1.312869	0.205378
1.570796	1	6.13E-17
1.727876	0.687131	-0.10749
1.884956	0.381966	-0.11803
2.042035	0.092019	-0.04178
2.199115	-0.17557	0.103198
2.356194	-0.41421	0.292893
2.513274	-0.61803	0.5
2.670354	-0.78201	0.696779
2.827433	-0.90211	0.85796
2.984513	-0.97538	0.963368
3.141593	-1	1
3.298672	-0.97538	0.963368
3.455752	-0.90211	0.85796
3.612832	-0.78201	0.696779
3.769911	-0.61803	0.5

3.926991	-0.41421	0.292893
4.08407	-0.17557	0.103198
4.24115	0.092019	-0.04178
4.39823	0.381966	-0.11803
4.555309	0.687131	-0.10749
4.712389	1	-1.8E-16
4.869469	1.312869	0.205378
5.026548	1.618034	0.5
5.183628	1.907981	0.866205
5.340708	2.175571	1.278768
5.497787	2.414214	1.707107
5.654867	2.618034	2.118034
5.811946	2.782013	2.478792
5.969026	2.902113	2.760074
6.126106	2.975377	2.938745
6.283185	3	3

9. Select the range of cells C2-D42 by selecting cell C2, holding the left mouse button and dragging over the cells C2-D42.

10. Click the graphing tool, from the interactive dialog box that will appear select “xy scatter, data connected by smooth curves from the list of options that will appear. Click finish, the graph will appear in a separate box as shown below



with the only difference that the x and y axis will be labeled and you will see a legend and a grid on the graph. You can visually edit the graph to have the appearance you desire,