

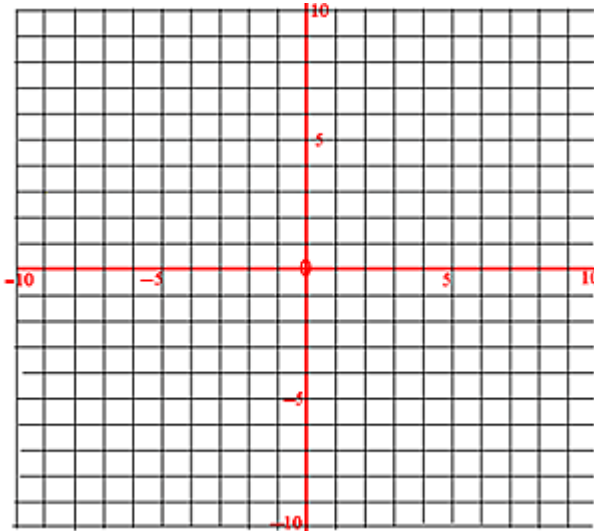
Name: _____ Date: _____ Class: _____

Ellipses and Eccentricity - Drawing Ellipses Using Paired Coordinates Lab Exercise

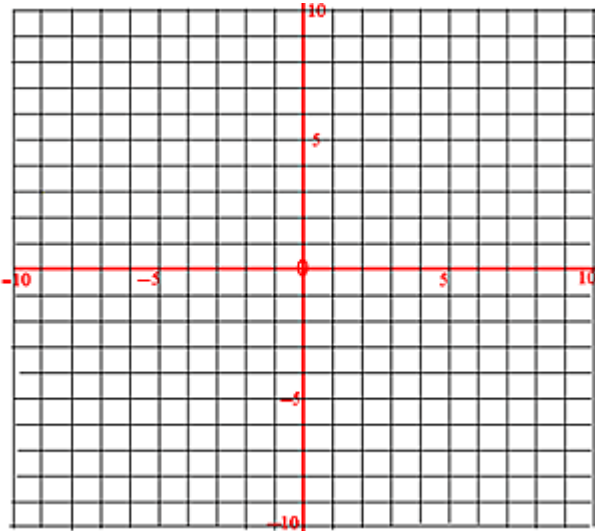
In this lab exercise you will plot pair of coordinates to draw 6 ellipses, compute their eccentricities and then answer questions about the 6 ellipses.

Directions: Part 1: On the graphs plot the paired coordinates given in the data table on page 2. Connect all the points you plotted with a curved line. You may find it helpful to write additional numbers on the x and y axis in all directions from the origin. Show all the points you plot. No short-cuts! Use an "X" to represent the foci.

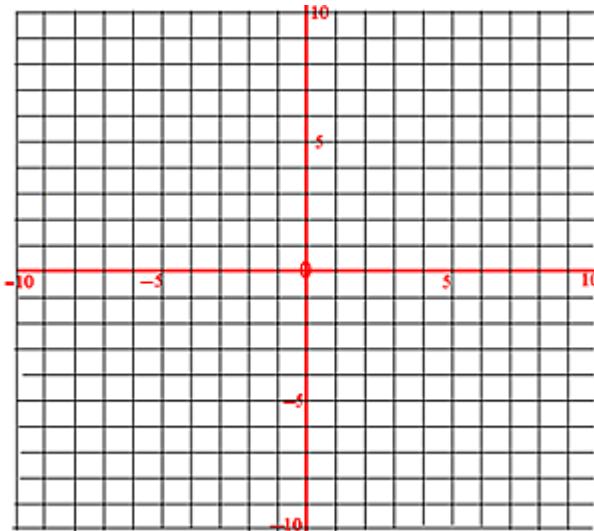
Ellipse 1



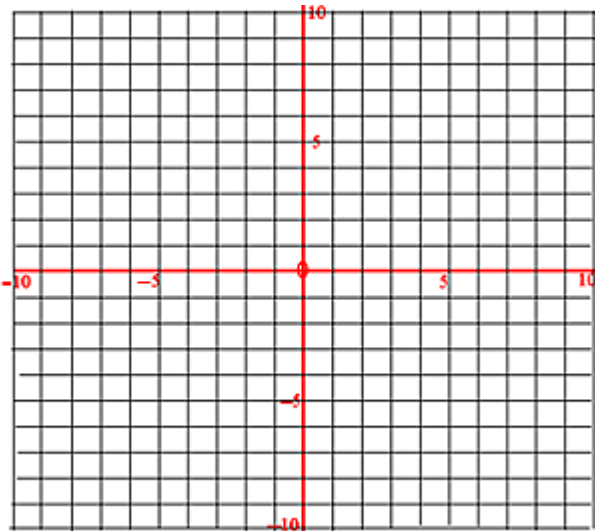
Ellipse 2



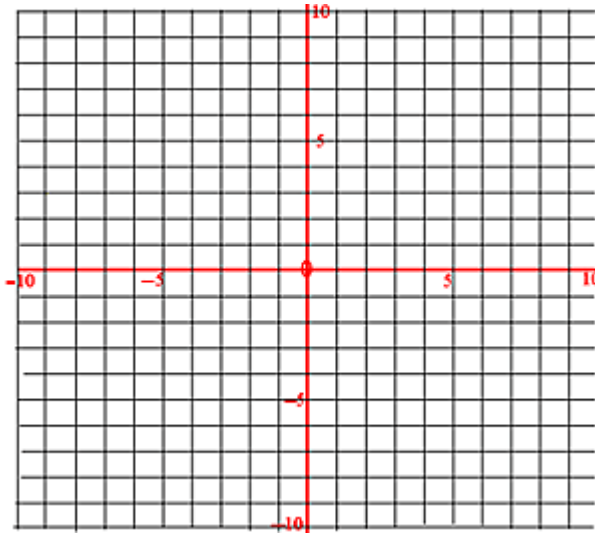
Ellipse 3



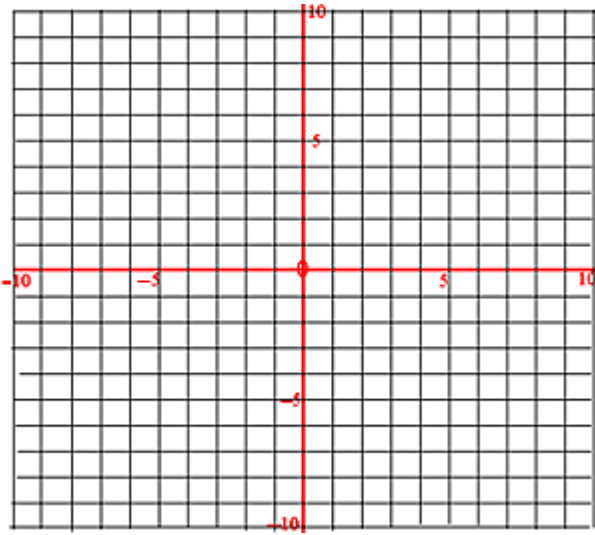
Ellipse 4



Ellipse 5



Ellipse 6



DATA TABLE					
Ellipse	X Axis	Y Axis	Ellipse	X Axis	Y Axis
1	0	± 8.0	4	0	± 4.5
	± 3.0	± 7.5		± 2.0	± 4.2
	± 6.0	± 6.0		± 3.0	± 4.0
	± 8.0	± 3.7		± 4.0	± 3.4
	± 9.0	0		± 5.0	± 2.6
	Foci: ± 4.0	Foci: 0		± 6.0	0
2	0	± 6.0	5	0	± 3.0
	± 2.0	± 5.9		± 1.0	± 2.9
	± 4.0	± 5.3		± 2.0	± 2.8
	± 6.0	± 4.5		± 3.0	± 2.6
	± 8.0	± 2.8		± 4.0	± 2.2
	± 9.0	0		± 5.0	± 1.5
Foci: ± 6.0	Foci: 0	± 6.0	0		
3	0	± 3.0	6	0	± 9.0
	± 2.0	± 3.0		± 2.0	± 8.8
	± 4.0	± 2.8		± 4.0	± 8.2
	± 5.0	± 2.6		± 5.0	± 7.8
	± 6.0	± 2.2		± 6.0	± 7.0
	± 7.0	± 2.0		± 7.0	± 6.1
± 8.0	± 1.4	± 8.0	± 5.0		
± 9.0	0	± 9.0	± 3.0		
Foci: ± 8.5	Foci: 0	± 9.5	± 0		
			Foci: ± 2.0	Foci: 0	

Part 2: You will now compute the Eccentricity of all your Ellipses. Place your answers in the following Table and show your work. Round to nearest thousandths.

Use this equation: Eccentricity of an ellipse $eccentricity = \frac{\text{distance between foci}}{\text{length of major axis}}$

Eccentricity of Ellipses 1-6

Ellipse	Major Axis	Distance Between Foci	Your Work	Eccentricity
1				
2				
3				
4				
5				
6				

Part 3: Answer the following questions based on your lab data:

1. Which of the 6 ellipses is the most circular? Ellipse #: _____
2. State the eccentricity of the most circular ellipse: _____
3. Which of the 6 ellipses is the most eccentric (oval)? Ellipse #: _____
4. State the eccentricity of the most eccentric ellipse: _____

Consult the **Solar System Data Reference Table** on page 5 of this assignment. Look at the column labeled: *Eccentricity of Orbit* and then answer questions 5 and 6.

5. Of all 6 ellipses that you drew, which one has an eccentricity that *approximates* 2 of the orbital eccentricities listed on the Solar System Data Reference Table?

Ellipse #: _____

6. Name these 2 planets on the reference chart along with their orbital eccentricities:

Planet: _____ Orbital Eccentricity: _____

Planet: _____ Orbital Eccentricity: _____

7. Place your 6 ellipses in order from the **least eccentric** to the **most eccentric**. Also state the eccentricity of each.

Ellipse #: _____ Eccentricity: _____

Ellipse #: _____ Eccentricity: _____

Ellipse #: _____ Eccentricity: _____

Ellipse #: _____ Eccentricity: _____

Ellipse #: _____ Eccentricity: _____

Ellipse #: _____ Eccentricity: _____



Ellipses and Eccentricity Lab is © L. Immoor, Geoteach.com, Geolor.com 2006
Revised in 2007; All Rights Reserved.

Graph Paper is courtesy of [Mr. Vizza](#). Thank you!

Equation graphic © The University of the State of New York; Board of Regents;
[Earth Science Regents Examinations](#)

The text and the illustrations in this assignment are not to be copied or reproduced in any way for use in the classroom or on websites without providing credit back to Geoteach.com.

Geoteach.com Watermarks must remain on the document.

Solar System Data

Object	Mean Distance from Sun (millions of km)	Period of Revolution	Period of Rotation	Eccentricity of Orbit	Equatorial Diameter (km)	Mass (Earth = 1)	Density (g/cm ³)	Number of Moons
SUN	—	—	27 days	—	1,392,000	333,000.00	1.4	—
MERCURY	57.9	88 days	59 days	0.206	4,880	0.553	5.4	0
VENUS	108.2	224.7 days	243 days	0.007	12,104	0.815	5.2	0
EARTH	149.6	365.26 days	23 hr 56 min 4 sec	0.017	12,756	1.00	5.5	1
MARS	227.9	687 days	24 hr 37 min 23 sec	0.093	6,787	0.1074	3.9	2
JUPITER	778.3	11.86 years	9 hr 50 min 30 sec	0.048	142,800	317.896	1.3	16
SATURN	1,427	29.46 years	10 hr 14 min	0.056	120,000	95.185	0.7	18
URANUS	2,869	84.0 years	17 hr 14 min	0.047	51,800	14.537	1.2	21
NEPTUNE	4,496	164.8 years	16 hr	0.009	49,500	17.151	1.7	8
PLUTO	5,900	247.7 years	6 days 9 hr	0.250	2,300	0.0025	2.0	1
EARTH'S MOON	149.6 (0.386 from Earth)	27.3 days	27 days 8 hr	0.055	3,476	0.0123	3.3	—

Earth Science Reference Tables — 2001 Edition

Solar System Data Reference Table is courtesy of and is © The University of the State of New York; Board of Regents; Earth Science Regents Examinations.