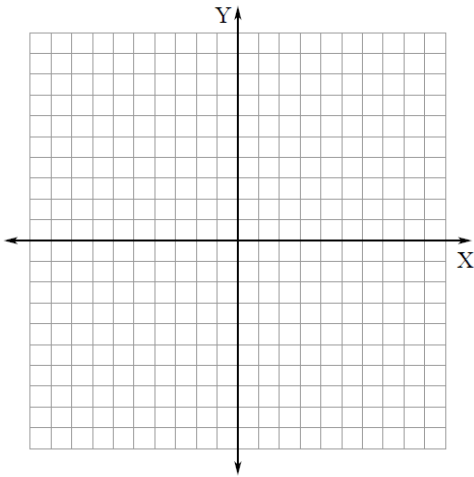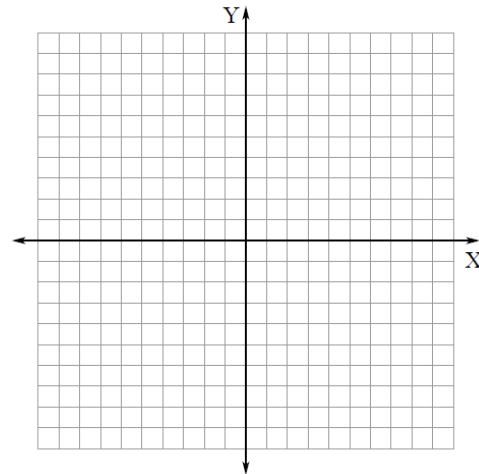**Algebra 2: more Ellipses**

Name: _____

**Write an equation for each ellipse described.
You may want to make a sketch to assist you.**
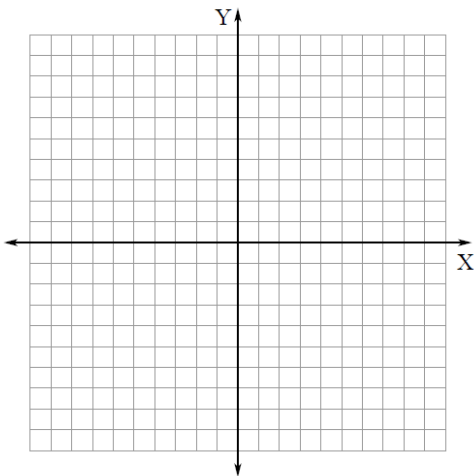
1. The endpoints of the major axis are (-10,-5) and (0,-5). The endpoints of the minor axis are (-5,6) and (-5,4).

2. The endpoints of the major axis are at (-4,-3) and (-4,15). The foci are at (-4,6 - $\sqrt{65}$) and (-4, 6 + $\sqrt{65}$).

3. The center is at (-1,-7). The major axis is 8 units and the minor axis is 6 units. The major axis is parallel to the y-axis.

4. The center has coordinates (2,-4). The minor axis is parallel to the x-axis with the length of 6. The major axis has a length of 10.
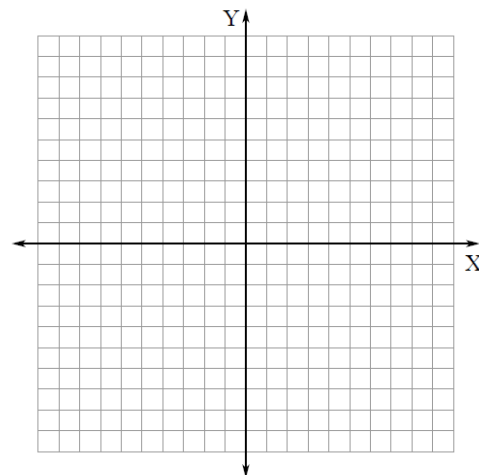
5.) **Application to Medicine**: A lithotripter can be used to break up kidney stones. This instrument uses the properties of the ellipse. An electrode sends shock waves out from one focus of an ellipse. The waves are then reflected off of an elliptical-curved surface to the other focus to blast the kidney stone! Suppose the length of the major axis of the ellipse is 40 cm and the length of the minor axis is 20 cm. How far from the kidney stone should the electrode be placed to destroy it?

6.) **Application to Architecture**: The United States Capitol Building contains an elliptical room. It is 96 feet in length and 46 feet in width.

a.) What is the equation to describe the shape of the room? Assume center is at origin and major axis is horiz.

b.) President John Quincy Adams discovered that he could eavesdrop on conversations being held at the opposing party leader's desk if he stood at a certain spot in this elliptical room! Describe the position of the desk and how far away Adams would have to stand to eavesdrop!!!