

Activity: Elliptic Curve Experiments I**Name:** _____

The graphs below show three elliptic curves $y^2 = x^3 + 5x + 10$, $y^2 = x^3 + 10$, and $y^2 = x^3 - 5x$. For each curve E , determine if each statement below is true or false.

1. If $(x, y) \in E$, so is $(x, -y)$.
2. If $(x, y) \in E$, so is $(-x, y)$.
3. If P and Q are points on E , then the line through P and Q intersects E in a third point R . (Try some examples with a straightedge.)
4. There is a line that intersects E in four points. (See if you can find one using a straightedge.)
5. The infinite component of E has two inflection points.
6. There is more than one line that intersects the curve in only one point. (Can you find more than one?)

