

### **Homework 3, due on Wednesday, February 17**

1. Find all rational solutions of the equation  $y^3 = x^2 - y^2$ .
2. An astroid is a particular mathematical curve: a hypocycloid with four cusps. Specifically, it is the locus of a point on a circle as it rolls inside a fixed circle with four times the radius. See

<https://en.wikipedia.org/wiki/Astroid>

Find all points with rational coordinates on the astroid with the center at the origin and cusps at points  $(0, \pm 1)$  and  $(\pm 1, 0)$ .