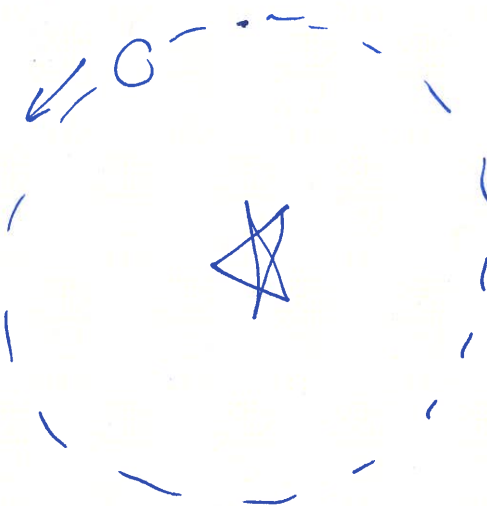


Orbital capture

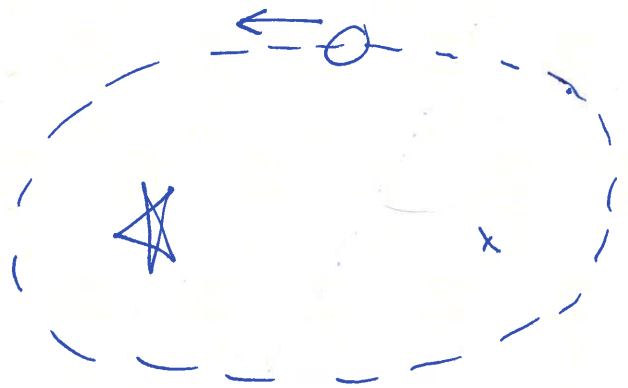
a) According to Kepler and Newton, two bodies interacting gravitationally can only have one of **four orbit types**.

DRAW representative diagrams for these **four orbit types** and label them.

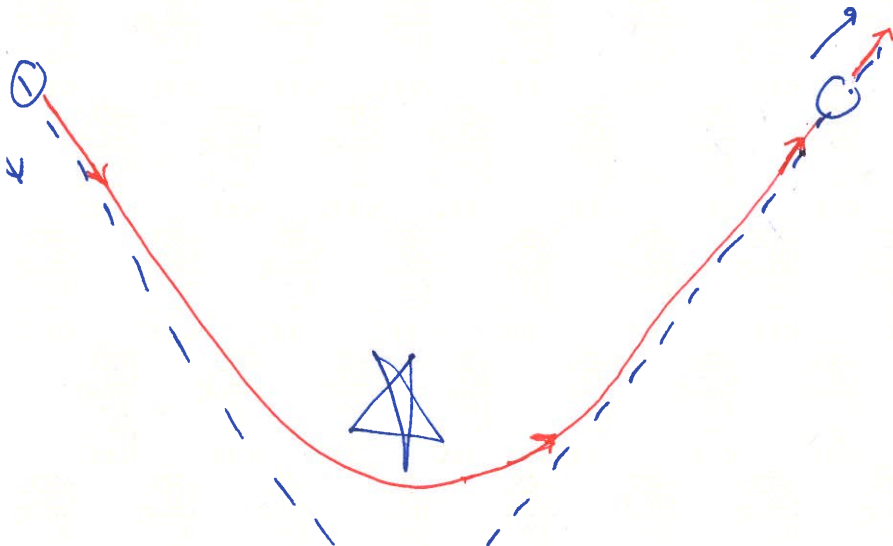
circle



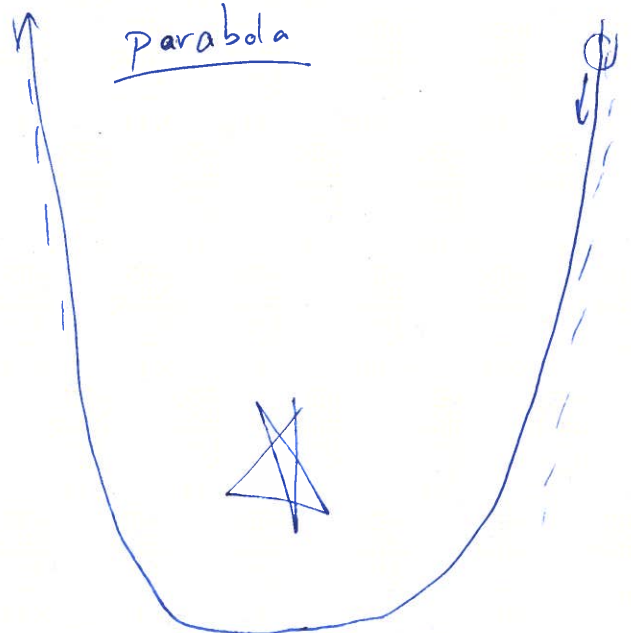
ellipse



hyperbola



parabola



b) Suppose that you want to orbit a distant object around a lone star. Initially, the object is very far from the star (and not in orbit, i.e. it does not feel the star's gravity in any significant way).

You launch the object towards the star, and somehow are successfully able to put the object in a **near circular orbit** around the star. This process is called orbital capture. *3rd body needed (another planet, rocket exhaust, etc)*

DRAW a 2D diagram (in the object-star ecliptic plane) that shows **the trajectory** of the object from far away to in-orbit around the star.

The diagram does not have to be "mathematically correct", just a reasonable qualitatively correct diagram for the orbital capture sequence.

