2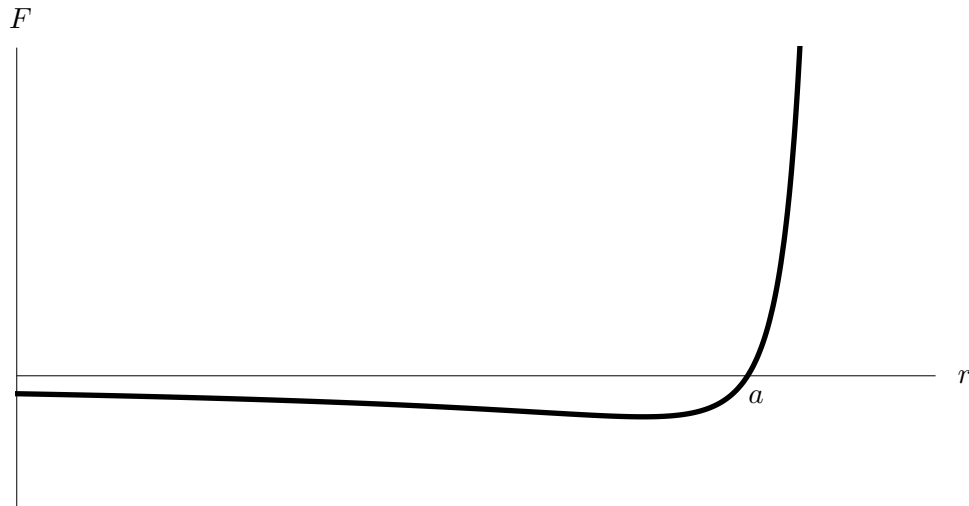. [6 points] The force, F, between two magnets arranged in an array depends on the distance r separating them. Looking at the graph below, a positive F represents a repulsive force; a negative F represents an attractive force. The horizontal intercept of the graph is $r = a$.

   a. [1 point] What happens to the force if the magnets start with $r = a$ and are pulled slightly farther apart?

   b. [1 point] What happens to the force if the magnets start with $r = a$ and are pushed slightly closer together?

   c. [4 points] The magnets are said to be in *stable equilibrium* if the force between them is zero and the magnets tend to return to the equilibrium after a minor disturbance. Does $r = a$ represent a stable equilibrium? Give a brief explanation.