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 \( r = a \).

\[ \begin{array}{c}
| \quad \quad \quad F \\
\hline
| \quad \quad a
\end{array} \]

\( r \)

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.