1   potential

A particle is constrained to move in one dimension, x, is acted on by a force which is derived for the potential energy $U(x) = ax + \frac{b}{2}x^2$, where the constants a and b are positive.

1.1   force

What is the force, $f(x)$, from this potential as a function of x?

1.2   equilibrium x position

Find the equilibrium position, x_0, the x position where the force is zero.

1.3   stability

Is this equilibrium position, x_0, stable or unstable? Show why.