Handout on Feedback Stability

Given an operational amplifier with an internal architecture that provides the following transfer function:

$$H(s) = 4 \cdot 10^9 / [\ (1 + 0.08s)(\ s^2 + 628\ s + 3948)\ ]$$

where s is the complex frequency, there f is expressed in MHz, provide answer to the following questions:

1. Find the location of the poles in the complex plane, and give their frequency.

2. Plot the corresponding Bode diagram (Amplitude and Phase), clearly stating the slope of each trace.

On the assumption that this amplifier will be used in the set up of a Wien Bridge oscillator,

3. ¿Is it posible to use this OP AMP in the required application? Please, justify the answer using the Nyquist diagram.

4. In case that we need to compensate the amplifier, please do so with a phase margin of 45º.