complex-valued f(x) $\longrightarrow$ | system | $\longrightarrow$ g(x)

The output g(x) has the same magnitude as f(x).
However, the system passes the phase of f(x) through
a linear, time-invariant system.

a) Is the overall system linear? Explain.

b) Is the overall system time invariant? Explain

c) Is the overall system causal? Explain.