Consider an auto-regressive process $u(n)$ of order two described by the following equation

$$u(n) = u(n-1) - 0.5u(n-2) + v(n)$$

where $v(n)$ is white noise with zero mean and variance 0.5.

a) Write the Yule-Walker equations for the process.
b) Solve these equations for the autocorrelation values $r(1)$ and $r(2)$.
c) Find the variance of $u(n)$.