Math 172 **Quiz 3** **September 19, 2005**

Name _____

1. Consider the dynamical system

$$u(n) = 0.3u(n-1) - 0.5v(n-1) + 30$$
$$v(n) = 0.2u(n-1) + v(n-1) - 4$$

(a) (2 points) Find the equilibrium point. Show your work in finding this equilibrium point.

(b) (3 points) Determine the stability of the equilibrium point.

(c) (5 points) For $u(0) = 15$ and $v(0) = 25$, determine the rate at which $v(n)$ goes toward infinity (if unstable) or goes toward equilibrium (if stable). Show the calculations you made to find the rate.