

Name \_\_\_\_\_

1. Given the dynamical system  $p(n) = 2p(n - 1) + 5$  with  $p(1) = 5$ , find values for  $p(2)$ ,  $p(3)$ , and  $p(4)$ .

2. Consider the following dynamical system of two equations.

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

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

If  $u(0) = 3$  and  $v(0) = 2$ , then determine  $u(3)$  and  $v(3)$ .

3. Let  $h(n)$  represent the height of a stack of  $n$  chairs. Each chair by itself is 3 feet high, but when stacked, the height of an existing stack only increases by 8 inches for each additional chair. A pattern doesn't really begin until you actually have one chair, so we won't define  $h(0)$  but will start with  $h(1) = 3$ . Be consistent with your units and do the following:

(a) Develop a discrete dynamical system for  $h(n)$ .

(b) Find an explicit formula for  $h(n)$ .

