

## Quiz #7

Monday, November 27 2017

**Duration: 20 min**

**NAME:** \_\_\_\_\_

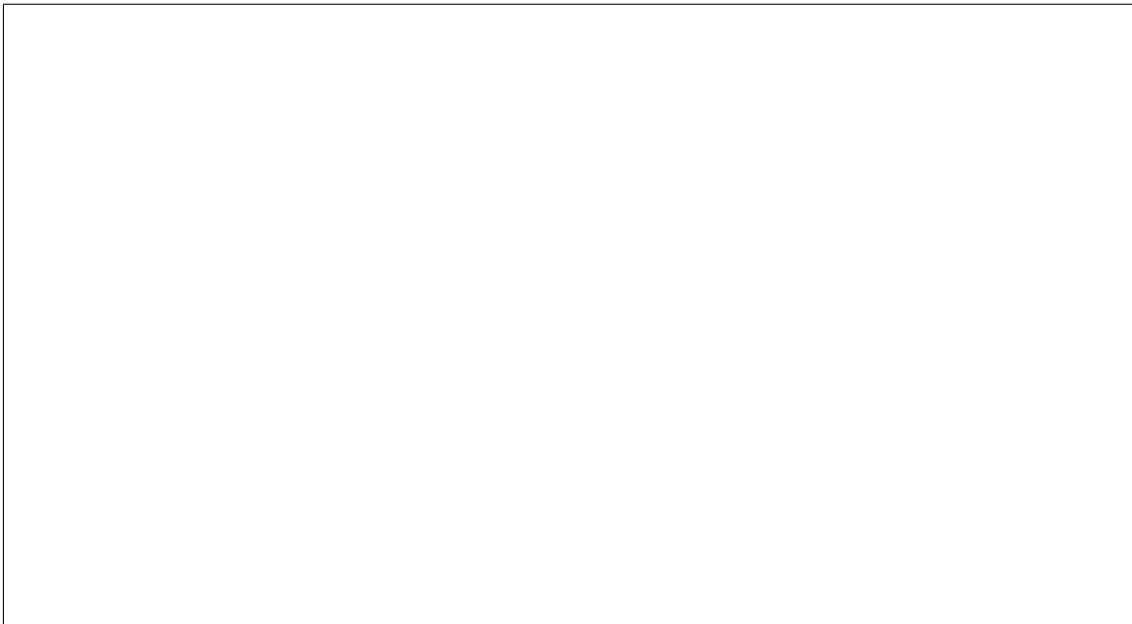
**Please write clearly and properly.**

<b>Problem</b>	<b>Grade</b>
<b>1</b>	
<b>Total</b>	

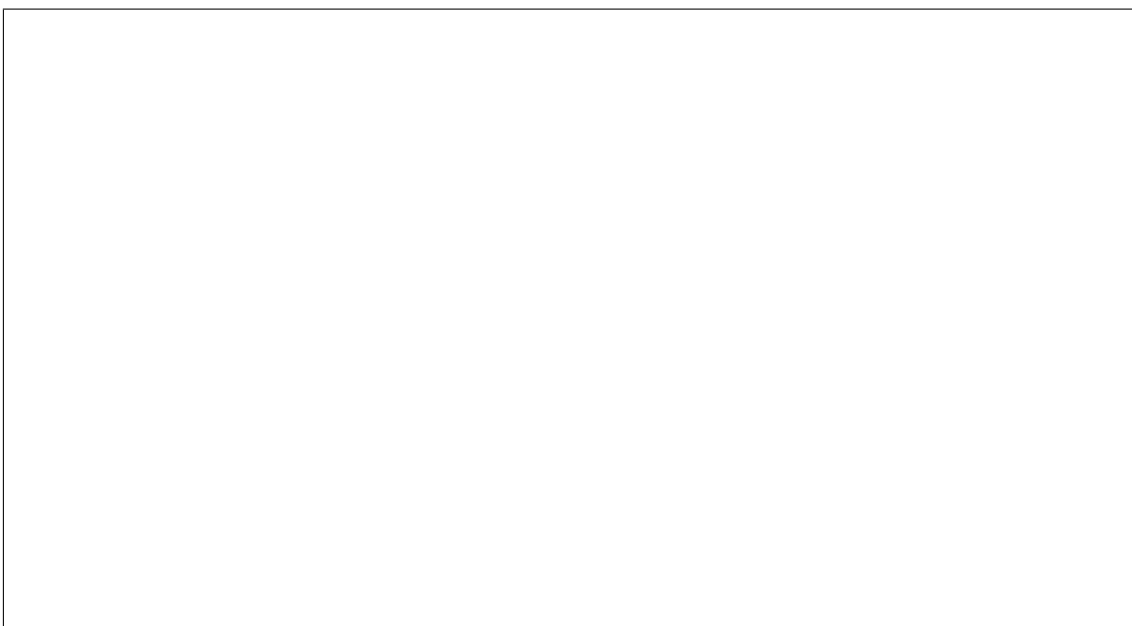
**Problem 1** (~ 10 points.).

Assume that a person makes an investment of \$1000 in a savings account with a 1% annual interest rate. Denote by  $Y_n$  the amount of money on the account after  $n$  years.

- (1) Find  $Y_0$ ,  $Y_1$  and  $Y_2$ .



- (2) Find a recurrence relation and an initial condition for the sequence  $(Y_n)$ . What kind of sequence is  $(Y_n)$ ?



(3) Write a recursive algorithm (in pseudocode) to compute  $Y_n$  (with  $n$  as input).

- (4) Solve the recurrence relation. Show that your formula result is correct by writing a proof by induction.

(5) Find a formula giving the minimum number of years to double the initial investment.