

# Math 2013 - Introduction to Discrete Mathematics

Quiz #13 - 2005.11.11

Name: \_\_\_\_\_

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Consider the following ordered array which contains 22 elements:

1	2	4	4	4	5	6	7	9	22	24	34	46	47	58	58	58	59	60	61	62	63
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1. How many steps will it take to find  $key = 60$  if one uses the binary search algorithm proposed in the book? Be sure to justify your answer.

2. Consider the algorithm to compute the GCD of two positive integers  $x$  and  $y$  given below (very similar to the one discussed in class).

```
 $x = 348, \quad y = 168$   
 $counter = 0$   
while  $x \neq y$  do  
     $counter = counter + 1$   
    if  $x > y$  then  
         $x = x - y$   
    else  
         $y = y - x$   
    end while  
 $gcd = x$ 
```

What is the final value of  $counter$  and what is the value of  $gcd$ ?