

Name: _____ Section: ____ Andrew Id: _____

15-112 Spring 2014 Quiz 2

* 25 minutes. No calculators, no notes, no books, no computers. No strings, lists, or recursion!

* Do not discuss this quiz with anyone until after 5pm today. SHOW YOUR WORK, CIRCLE YOUR ANSWERS.

1. **Code Tracing** [28 pts; 2 pts each]: Indicate what this will print, filling in the spaces provided on the right:

<pre>def ct1(x, y): for z in xrange(x, y): if (z < y/2): if (z%4 == 0): print (4,z) elif (z%2 == 0): print (2,z) elif (x+y+z == 25): print (25, z) for z in xrange(y, x): print (42, z) w = 0 for z in xrange(x, 10*x, x): if (z < 5*x): continue elif (z >= 7*x): return (z,w) w += z return (99,99) print ct1(4, 14) # prints 4 (x,y) tuples def f(x, d): return d + (x/2 if (x < 10) else x/3) def ct2(x): counter = 0 target = 5 # does not start at 0 while (target < 7): if (f(counter, x) == target): print (counter, target) target += 1 counter += 1 return (counter, target) # careful! print ct2(1) # prints 3 (x,y) tuples</pre>	<p>(_____ , _____)</p> <p>(_____ , _____)</p> <p>(_____ , _____)</p> <p>(_____ , _____)</p> <p>(_____ , _____)</p> <p>(_____ , _____)</p>
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2. **Reasoning Over Code** [12 pts]

Find arguments for the following function that make it return True. You only need one set of arguments for the function, even if there are multiple correct answers.

```
def rc1(m):
    if ((type(m) != int) or (m < 0)): return False
    x = 1
    while (x < m**2): x *= 2
    return (x - m**2 == 15)
```

3. **Short Answer** [20 pts; 5 pts each]

a. What is carrylessAdd(329, 82)?

b. What is nthEmirp(1)?

c. The function $f(x) = x^2$ has a zero at $x=0$, but `findZeroWithBisection(f, -1, +1, 0.01)` would not find it. Why?

d. In `play112`, why did we use 8 and not 0 to represent a blank space?

4. **Free Response: sameDigits(m, n)** [40 pts]

Write the function `sameDigits(m, n)` that takes two possibly-negative int values and returns True if they each contain the same digits (if perhaps in different quantities), and False otherwise. For example, `sameDigits(3123, 1333322)` returns True, and `sameDigits(32, -233)` returns True, but `sameDigits(123, 122)` returns False. Hint: You may want to write one or two well-chosen helper functions. To receive any credit, you must not use strings here.

5. **Bonus/Optional:** [2.5 pts] What will this print? For credit, be sure to show your work!

```
def bonus(x, y, z=32): return (x+y) if (z>32) else bonus(y, x+y, 2*(x+y))
print bonus(5, 11)
```