CS100 Fall 2015

Name _____

CPADS Exam 2 – Part I

Problem 1 (5 points): Write the following mathematical formula as a Python statement

$$c^2 = a^2 + b^2 + 2ab\cos\gamma$$

c2 = (a ** 2) + (b ** 2) + (2 * a * b * cos(gamma))

Problem 2 (10 points): What is the output of the following code block. You may not need all the rows.

```
sum = 2
for i in range(5):
  sum = sum + 2*i
  print('i = ', i)
  print('sum = ', sum)
```

i = **0** sum = **2**

i = **1** sum = **4**

i = **2** sum = **8**

i = **3** sum = **14**

i = **4** sum = **22**

i = _____ sum = _____

i = _____ sum = _____

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Problem 3 (10 points): Given the following code

```
if speed > speed_limit + 25:
   print('Give me your license, you're walking home!')
   points = 10000
if speed > speed_limit + 10 and points < 2:
   print('Fine = $100')
   points = points + 4
elif speed > speed_limit + 10:
   print('Fine = $200')
   points = points + 6
else:
   print('I just saved 15% on my car insurance with Geiko!')
print('Your points are ',points)
```

What is the output when:

(a) `speed_limit = 55; speed = 60; points = 0`

I just saved 15% on my car insurance with Geiko!
Your points are 0

(b) `speed_limit = 25; speed = 60; points = 4`

Give me your license, you're walking home!
Fine = $200
Your points are 10006

(c) `speed_limit = 45; speed = 40; points = 10`

I just saved 15% on my car insurance with Geiko!
Your points are 10

(d) `speed_limit = 50; speed = 80; points = 0`

Give me your license, you're walking home!
Fine = $200
Your points are 10006

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Problem 4 (10 points): What is the output of the following code block. You may not need all the rows. Hint: % is the *modulo* operator in Python, i.e. computes the *remainder* of the division.

```
num = 12
for i in range(num // 2):
  i = i + 1
  if num % i == 0:
      print('i = ', i)
      print(`num/i = ', num/i)
```

i = **1**	num/i = **12**
i = **2**	num/i = **6**
i = **3**	num/i = **4**
i = **4**	num/i = **3**
i = **6**	num/i = **2**
i = _____	num/i = _____
i = _____	num/i = _____
i = _____	num/i = _____
i = _____	num/i = _____
i = _____	num/i = _____
i = _____	num/i = _____
i = _____	num/i = _____

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Problem 5 (15 points): Determine the output for the following code if the user inputs the value **31**. You may not need all the rows. Hint: // is the *integer* division operator in Python.

```
min = 1
max = 100
num = int(input('Enter a value between 1 and 100'))
guess = (max + min) // 2
print('initial min = ', min)
print('initial max = ', max)
print('initial guess = ', guess)

tries = 1
while guess != num:
  if guess < num:
        min = guess
  else:
        max = guess
  guess = (max + min) // 2
  tries = tries + 1
  print ('new min = ', min)
  print ('new max = ',max)
  print ('New guess = ',guess)

print ('It took ', tries, ' tries to guess right!')
```

initial min = ____**1**____ initial max = ___**100**____ initial guess = ___**50**____

new min = _____**1**____ new max = ____**50**____ new guess = ____**25**____

new min = ____**25**____ new max = ____**50**_____ new guess = ____**37**____

new min = ____**25**____ new max = ____**37**_____ new guess = ____**31**____

new min = _____ new max = _____ new guess = _____

new min = _____ new max = _____ new guess = _____

new min = _____ new max = _____ new guess = _____

new min = _____ new max = _____ new guess = _____

It took _____**4**_____ tries to guess right!