CS21, Swarthmore College, Fall 2007, Practice Quiz 3

NAME:

1. Consider the program shown below:

```python
def helper1(word, letter):
    for i in range(len(word)):
        if word[i] == letter:
            return i
    return -1

def helper2(word, letter):
    total = 0
    for ch in word:
        if ch == letter:
            total += 1
    return total

def main():
    test = "frisbee"
    check = "e"
    print helper1(test, check)
    print helper2(test, check)

main()
```

(a) Define the term *argument* and give an example from the program above.

(b) Define the term *parameter* and give an example from the program above.

(c) Describe the steps that occur when a function call is executed. Use an example from the above program.

(d) What would be better names for `helper1` and `helper2`?

(e) What is printed when this program is run?

2. Consider the function below which is intended to determine whether a given number is negative, zero, or positive.

```
def testNumber(n)
    if n < 0:
        print "negative"
    if n > 0:
        print "positive"
    else:
        print "zero"
```

(a) What will be printed for `testNumber(5)`?

(b) What will be printed for `testNumber(-5)`?

(c) What will be printed for `testNumber(0)`?

(d) Does the function give the desired result?
    If not, write a corrected version below.

3. A person is eligible to be a US senator if he or she is at least 30 years old and has been a citizen for at least 9 years. Write a program that takes a person's age and years of citizenship as input and returns their eligibility for the Senate. For example:

```
>>> main()
Enter your age >> 30
Enter years US citizen >> 5
Eligibility for the Senate:
You have not been a US citizen long enough.

>>> main()
Enter your age >> 30
Enter years US citizen >> 10
Eligibility for the Senate:
You are eligible!

>>> main()
Enter your age >> 29
Enter years US citizen >> 10
Eligibility for the Senate:
You are too young.
```

4. Many US companies pay time-and-a-half for any hours worked above 40 in a given week. For example, an employee who makes \$10 an hour and worked 45 hours in a particular week would make $(\$10 * 40) + (\$15 * 5) = \$475$. Below is a program that takes the number of hours worked and the hourly rate as input and calculates the week's wages.

```
def main():
    hours = input("Enter the number of hours worked this week >> ")
    rate = input("Enter the hourly rate >> ")
    if hours <= 40:
        wages = hours * rate
    else:
        wages = 40 * rate + (hours - 40) * 1.5 * rate
    print "Wages are", wages
```

(a) Rewrite this program so that it now uses a function called `wages` that takes the hours worked and hourly rate as parameters and returns the week's pay. Be sure to show the updated version of `main`.

(b) Even though this second version is longer than the first version, give three reasons why it is better to use a function in this situation.