Quiz 3. For questions 3-8, *circle the correct answer.* Points: (3+3+4+4+4+4+4+4 = 30)

1. Write your full name.	Key
2. Write your UA email.	

For Questions 3 & 4, refer to the pseudocode below.

```
sum = 0
for i from 1 to n:
     for j from 1 to i:
          sum++
     end for
end for
```

3. What is the exact value of *sum* after the pseudocode executes?

A. $n(n-1)/2$ B. $n(n+1)/2$ C. $2n-1$ D. $2n+1$ E. 2^n-1

4. What is the runtime of the pseudocode?

A. $\theta(1)$ B. $\theta(logn)$ C. $\theta(n)$ D. $\theta(nlogn)$ E. $\theta(n^2)$

For Questions 5 & 6, refer to the pseudocode below. Assume n is a power of 2.

```
sum = 0
while n > 0:
     for i from 1 to n:
          sum++
     end for
     n = n/2
end while
```

5. What is the exact value of *sum* after the pseudocode executes?

A. $n(n-1)/2$ B. $n(n+1)/2$ C. $2n-1$ D. $2n+1$ E. 2^n-1

6. What is the runtime of the pseudocode?

A. $\theta(1)$ B. $\theta(logn)$ C. $\theta(n)$ D. $\theta(nlogn)$ E. $\theta(n^2)$

For Questions 7 & 8, refer to the pseudocode below.

```
function foo(n:int)
     if n = 1 then return 1
     do an O(n) operation
     return foo(n-1)
end foo
```

7. Which recurrence relation best describes the runtime of *foo*? In all cases, $T(1) = 1$.

A. $T(n) = T(n-1) + 1$ B. $T(n) = T(n-1) + n$ C. $T(n) = T(n/2) + 1$ D. $T(n) = 2T(n/2) + 1$

E. None of the above.

8. What is the runtime of *foo*?

A. $\theta(1)$ B. $\theta(logn)$ C. $\theta(n)$ D. $\theta(nlogn)$ E. $\theta(n^2)$

Extra Credit (1 point)

What is the word I mentioned in class that means “a group of British schoolchildren walking 2 by 2”?