QotD11

Date Created: 6/17/15, 8:37:25 AM **Questions:** 2
Date Modified: 6/17/15, 8:47:07 AM

1. How does the Karatsuba algorithm improve over the simple divide and conquer algorithm for N-bit integer multiplication?
   (1 point)
   A. Reduces the amount of work done within each recursive call
   B. Reduces the size of each recursive subproblem
   ✓ C. Reduces the number of recursive subproblems generated
   D. None of the above

2. Consider the following for loop:

```
ans = 1;
for (k = 1; k <= Y; k++)
{
     ans = (ans * X) % Z;
}
```

   where ans, X, Y and Z are N-bit integers. Assuming the Gradeschool algorithm is used for

integer multiplication, what is the worst case Theta run-time for the code segment?
(1 point)

A. Theta(N^2)

B. Theta(N^3)

C. Theta(2^N)

✓ D. Theta($N^2 2^N$)