

Name: _____

NetID: _____ Lecture: B

Discussion: Friday 11 12 1 2 3 4

(15 points) Check the (single) box that best characterizes each item.

$T(1) = d$	$\Theta(\log n)$	☒	$\Theta(\sqrt{n})$	☐	$\Theta(n)$	☐	$\Theta(n \log n)$	☐
$T(n) = T(n/2) + d$	$\Theta(n^2)$	☐	$\Theta(n^3)$	☐	$\Theta(2^n)$	☐	$\Theta(3^n)$	☐

$T(1) = d$	$\Theta(\log n)$	☐	$\Theta(\sqrt{n})$	☒	$\Theta(n)$	☐	$\Theta(n \log n)$	☐
$T(n) = 2T(n/4) + c$	$\Theta(n^2)$	☐	$\Theta(n^3)$	☐	$\Theta(2^n)$	☐	$\Theta(3^n)$	☐

Finding a value in a sorted array is $\Theta(2^n)$. true ☐ false ☒

Problems in class P (as in P vs. NP)
require exponential time true ☐ false ☒ not known ☐

The Travelling Salesman
problem can be solved in
polynomial time. true ☐ false ☐ not known ☒

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$T(1) = d$	$\Theta(n)$	☒	$\Theta(n \log n)$	☐	$\Theta(n^2)$	☐	$\Theta(n^3)$	☐
$T(n) = 3T(n/3) + c$	$\Theta(n^{\log_3 2})$	☐	$\Theta(n^{\log_2 3})$	☐	$\Theta(2^n)$	☐	$\Theta(3^n)$	☐

$T(1) = d$	$\Theta(\log n)$	☐	$\Theta(\sqrt{n})$	☐	$\Theta(n)$	☒	$\Theta(n \log n)$	☐
$T(n) = T(n/2) + n$	$\Theta(n^2)$	☐	$\Theta(n^3)$	☐	$\Theta(2^n)$	☐	$\Theta(3^n)$	☐

Algorithm A takes 2^n time. On one input, A takes x time. How long will it take if I double the input size?

$x + 2$ ☐ $2x$ ☐ 2^x ☐ x^2 ☒

Problems in class NP require exponential time

true ☐ false ☐ not known ☒

Circuit satisfiability can be solved in polynomial time.

true ☐ false ☐ not known ☒