

Group Work on Section 3.3
Professor Ostheimer

1. Define \mathcal{NP} -complete.
2. This is all about reading comprehension. Read each question carefully. Read your index cards carefully. For this problem all you need to know about the *Graph Isomorphism* problem is that it is known to be in \mathcal{NP} , it is not known if it is in \mathcal{P} and it is not known if it is \mathcal{NP} -complete. You need to know everything we learned in class about the *Knapsack* problem, including the fact that it is known to be \mathcal{NP} -complete. Indicate whether each of the following statements is **True**, **False** or rather if we **Don't Know** if it's true or false.
 - (a) *Graph Isomorphism* is in \mathcal{P} .
 - (b) *Knapsack* is in \mathcal{P} .
 - (c) *Graph Isomorphism* is in \mathcal{NP} .
 - (d) *Knapsack* is in \mathcal{NP} .
 - (e) *Graph Isomorphism* is \mathcal{NP} -complete.
 - (f) *Knapsack* is \mathcal{NP} -complete.
 - (g) If *Graph Isomorphism* is in \mathcal{P} , then *Knapsack Problem* is in \mathcal{P} .
 - (h) If *Knapsack* is in \mathcal{P} , then *Graph Isomorphism* is in \mathcal{P} .
 - (i) If *Graph Isomorphism* is not in \mathcal{P} then $\mathcal{P} \neq \mathcal{NP}$.
 - (j) If *Knapsack* is not in \mathcal{P} then $\mathcal{P} \neq \mathcal{NP}$.