1. **Predicate Logic**: Show the predicate, including the domain, for the following English statements and say whether the predicate is true or false. If true give an example, else give a counterexample.

There exists a natural number greater than -7 and less than or equal to -1.

$x Î N, where -7 < x <= -1

true, -5

The cube of all integers is greater than 0.

∀x Î integer, where x^3>0

false, 0^3 = 0

One or more students in CS161 studied computer science in high school.

$x Î{ CS161 students }^{ students have studied computer science in high school}

true

1. **Predicate Logic:** Write English statements for the following predicate logic and say whether the predicate is true or false. If true give an example, else give a counterexample.

**$x Î Z+, where 29 < x2 < 42**

true, if x = 6, x2 =36, 29<x2 <42

∀**x Î N, (x \* x \* x) > x + x + x**

false, if x = 1, x\*x\*x=1, x+x+x=3, (x \* x \* x) < x + x + x

**$s Î** **{ CS160 students }, P(s) and Q(s), where P is attending all labs and Q is completing all programming assignments.**

true, I attend all labs and I complete all programming assignments.