CSci 2041 - Advanced Programming Principles

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Homework 3

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**Question 1:**

We would like to show that

The principle of induction for natural numbers is

In this case, our property P is defined as

is

Our induction proof would have two cases:

* : show that

by definition of

* : show that where holds by the inductive hypothesis.

by definition of

by property of addition and subtraction

by inductive hypothesis

by property of multiplication and power

**Question 2:**

We would like to show that

The principle of induction for this typeis

In this case, our property P is defined as

is

Our induction proof would have two cases:

* : show that

by definition of

by definition of power

by definition of

* : show that when holds by the inductive hypothesis.

by the definition of

by induction hypothesis

by the definition of multiplication and power

by the definition of

**Question 3:**

**Question 4:**

**Question 5:**

**Question 6:**

**Question 7:**