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| **COMP-232**  **MATHEMATICS FOR COMPUTER SCIENCE Fall 2019**  Assignment #2  **Shadi Jiha**  **#** **40131284** |

**1. Let P(x; y; z) denote the statement \x + y B z, " where x; y; z > Z+. What is the truth value of each of the following? Explain your answers.**

**2. For each of the premise-conclusion pairs below, give a valid step-by-step argument (proof) along with the name of the inference rule used in each step. For examples, see pages 73 and 74 in textbook.**

**3. For each of the following, determine whether the argument is valid. You may use a counterexample or equivalence transformations to justify your answer.**

False if

|  |  |  |
| --- | --- | --- |
|  |  |  |
| T | T | T |
| T | F | T |
| F | T | T |
| F | F | T |

So, it is valid

1. ((

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Now it is easy to do truth table and we see that if the result will be false. So, the argument is invalid.

|  |  |  |
| --- | --- | --- |
|  |  |  |
| T | T | T |
| T | F | T |
| F | T | T |
| F | F | T |

So, the argument is valid.

**4. For each of the arguments below, indicate whether it is valid or invalid.**

So:

Helen eats an apple a day

Helen is healthy

Which satisfies the initial equations

So:

Herbert eats an apple a day

Helen is healthy

. It seams okay on paper. However, for this statement to be true the initial condition should be an “if and only if” as follows . Because otherwise, Herbert can be unhealthy for other reasons, not necessarily not eating applies. So, the argument isn’t valid

1. let

So, let and . If neither of those are equal to 0 then the quadratic equation cannot be satisfied and thus the argument is valid

**5. Use rules of inference to show that if are true, then is true**

**6.**

**e) Prove that given a nonnegative integer n, there is a unique nonnegative integer m, such**

**that m2 B n < (m+ 1)2.**

Case 1: n is a perfect square so

Take

For example,

Case 2: n is not a perfect square so

Take

For example,