

Math 245: Arguments with Quantified statements

Fill in the valid conclusions or need hypotheses to create a valid argument.

1. If an integer n equals $2 \cdot k$ and k is an integer, then n is even.

0 equals $2 \cdot 0$ and 0 is an integer

\therefore _____

2. If a computer program is correct, then compilation of the program does not produce error messages.

\therefore This computer program is not correct

Which arguments below are valid and which are invalid?

3. All healthy people eat an apple a day.

Keisha eats an apple a day.

\therefore Keisha is a healthy person.

4. If a product of two numbers is 0 , then at least one of the numbers is 0 .

For a particular number x , neither $(2x+1)$ nor $(x-7)$ equals 0 .

\therefore The product $(2x + 1) (x - 7)$ is not 0 .

5. If a number is even, then twice that number is even.

The number $2n$ is even, for a particular number n .

\therefore The particular number n is even.

6. All supermodels are tall and skinny.

Gisele is a supermodel.

\therefore Gisele is tall and skinny.

7. If a person has pneumonia, then he has a fever and chills, coughs deeply, and is tired.

Bill does not have pneumonia.

\therefore Bill does not have a fever or chills, or deep coughing fits, or fatigue.

8. Reorder the premises in following argument to show that the conclusion follows as a valid consequence from the premises. It may be helpful to rewrite statements in if-then form and replace some statements by their contrapositives. (from *Symbolic Logic* by Lewis Carroll)

a. When I work a logic example without grumbling, you may be sure it is one I understand.

b. The arguments in these examples are not arranged in regular order like the ones I am used to.

c. No easy examples make my head ache.

d. I can't understand examples if the arguments are not arranged in regular order like the ones I am used to.

e. I never grumble at an example unless it gives me a headache.

\therefore These examples are not easy.