

# Homework 4

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**Problem 1.** Determine whether or not the following natural-language argument is valid by (i) translating it into  $L$ , (ii) constructing a truth table for the translated argument, and (iii) using the truth table to explain why the argument is—or is not—valid.

1. John Carpenter directed 'The Thing'.
2. If John Carpenter did not direct 'The Thing', then someone else directed 'The Thing'.
3. Someone else directed 'The Thing'.

**Problem 2.** Determine whether or not the following natural-language argument is valid by (i) translating it into  $L$ , (ii) constructing a truth table for the translated argument, and (iii) using the truth table to explain why the argument is—or is not—valid.

1. Abe Lincoln was born in Indiana or Illinois.
2. Abe Lincoln was not born in Illinois.
3. Abe Lincoln was born in Indiana.

**Problem 3.** Determine whether or not the following natural-language argument is valid by (i) translating it into  $L$ , (ii) constructing a truth table for the translated argument, and (iii) using the truth table to explain why the argument is—or is not—valid.

1. It is raining.
2. There are clouds in the sky.
3. It is raining and there are clouds in the sky.

**Problem 4.** Determine whether or not the following natural-language argument is valid by (i) translating it into  $L$ , (ii) constructing a truth table for the translated argument, and (iii) using the truth table to explain why the argument is—or is not—valid.

1. Addie did not attend the funeral.
2. Either Addie attended the funeral or Anse did.
3. Anse attended the funeral.

**Problem 5.** Determine whether or not the following natural-language argument is valid by (i) translating it into  $L$ , (ii) constructing a truth table for the translated argument, and (iii) using the truth table to explain why the argument is—or is not—valid.

1. If light is made of particles, then light cannot create an interference pattern.
2. Light can create an interference pattern.
3. Light is not made of particles.

**Problem 6.** Determine whether or not the following natural-language argument is sound by (i) translating it into  $L$ , (ii) constructing a truth table for the translated argument, (iii) using the truth table to explain why the argument is—or is not—valid, and (iv) determining whether or not the premises in the natural-language argument are true.

1. If Mark Twain wrote more than fifty books, then Mark Twain wrote more than forty books.
2. Mark Twain did not write more than fifty books.
3. Mark Twain did not write more than forty books.

**Problem 7.** Determine whether or not the following natural-language argument is sound by (i) translating it into  $L$ , (ii) constructing a truth table for the translated argument, (iii) using the truth table to explain why the argument is—or is not—valid, and (iv) determining whether or not the premises in the natural-language argument are true.

1. Grass is green.
2. If grass is green, then grass is not purple.
3. Grass is not purple.

**Problem 8.** Determine whether or not the following natural-language argument is sound by (i) translating it into  $L$ , (ii) constructing a truth table for the translated argument, (iii) using the truth table to explain why the argument is—or is not—valid, and (iv) determining whether or not the premises in the natural-language argument are true.

1. Either the Padres won the 1998 world series or the Yankees won the 1998 world series.
2. The Padres did not win the 1998 world series.
3. The Yankees won the 1998 world series.

**Problem 9.** Determine whether or not the following natural-language argument is sound by (i) translating it into  $L$ , (ii) constructing a truth table for the translated argument, (iii) using the truth table to explain why the argument is—or is not—valid, and (iv) determining whether or not the premises in the natural-language argument are true.

1. *If Emily Dickinson was born in Chicago, then Emily Dickinson was born in Illinois.*
2. *Emily Dickinson was not born in Illinois.*
3. *Emily Dickinson was not born in Chicago.*

**Problem 10.** *Determine whether or not the following natural-language argument is sound by (i) translating it into  $L$ , (ii) constructing a truth table for the translated argument, (iii) using the truth table to explain why the argument is—or is not—valid, and (iv) determining whether or not the premises in the natural-language argument are true.*

1. *Virginia Woolf wrote ‘Ulysses’.*
2. *If Virginia Woolf wrote ‘Ulysses’, then James Joyce did not write ‘Ulysses’.*
3. *James Joyce wrote ‘Ulysses’.*