MATHEMATICAL MEADOW

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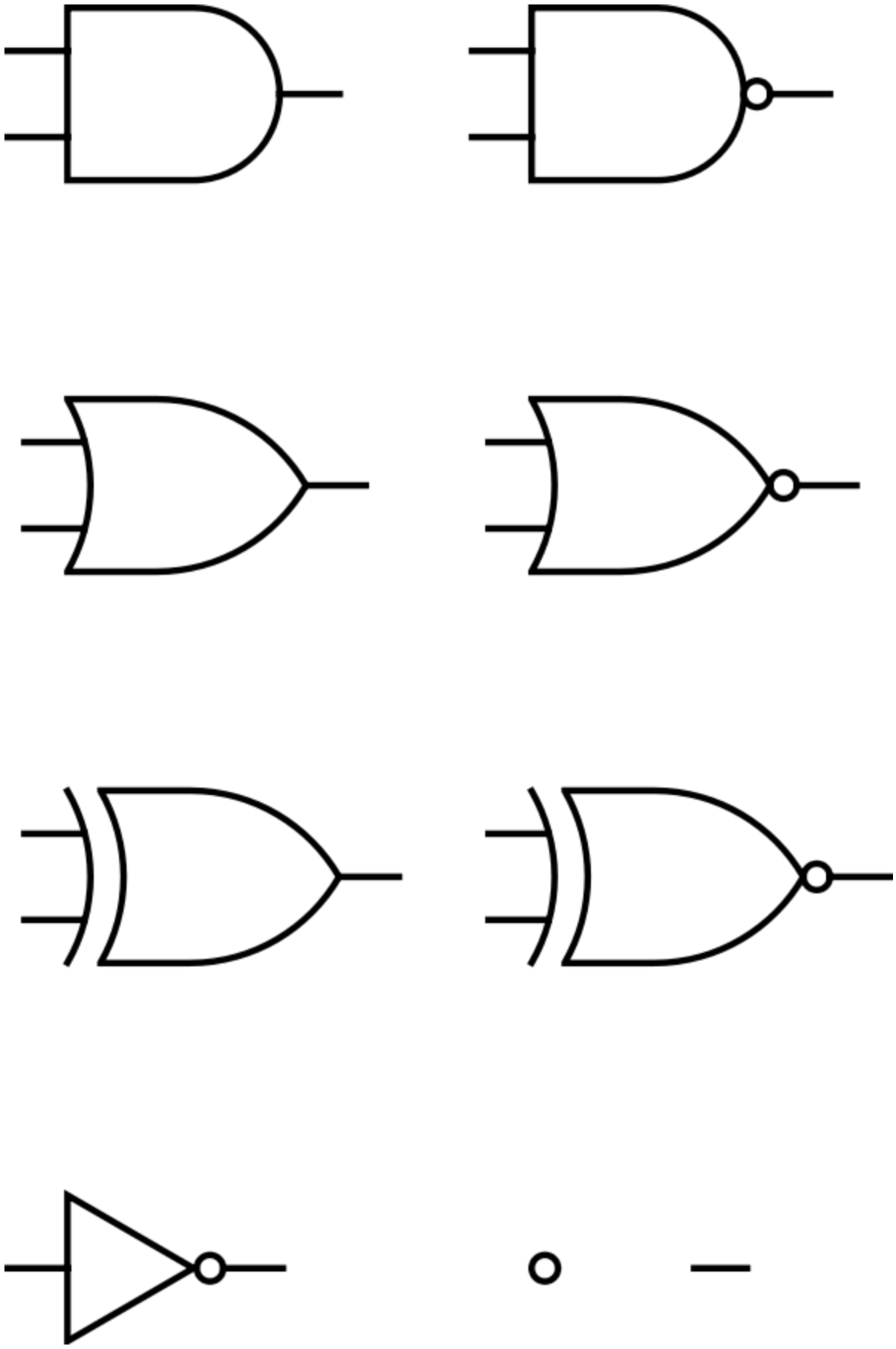
Mathematical Meadow was a lovely place. Situated in the rolling hills of Possibles Land, spanning the planes of both real and imaginary numbers.

There were many interesting characters who lived in the meadow. From Professor Crow, the Mathematical Rabbits, the Forgetful Cows, The Sociable Donkeys and many many others.



Chapter 1

Professor Crow & The Mathematical Rabbits help the Donkeys and the Cows to add up

Concepts: Boolean Logic, Boolean logic gates, Bistable Flip Flops, Half-Adders, Full-Adders, Astable MultiVibrator

Setting: **Mathematical Meadow**

There were once 4 donkeys who lived in Mathematical Meadow. They were brothers and passed their time chewing grass, socialising with the other meadow animals and thinking about how to best do up their paddocks.

Each brother had a distinct personality and lived in his own paddock. Each paddock had 2
gates, which each had a path to the front door of the DonkeyShed.

There was Brother **Exor**, a Donkey who had a problem with dealing with more than one guest at a time. He therefore would only open the door to his DonkeyShed if one person came to visit him. When there were two people (one at each gate), he would keep the door closed. Obviously, when there was no-one, the DonkeyShed door remained closed.

This is a picture of his paddock.

And this is what it looks like from the air.

Then there was Brother **Eand**. He could not bear to be spoken to one-on-one and so only opened his DonkeyShed door when 2 guests came to see him. He was, however, very sociable.

This is a picture of his paddock.

And this is what it looks like from the air.

Next up is Brother **Eoor**. He was the most sociable of all of them, welcoming guests, whether alone or accompanied. But even **Eoor** would not open the door to his DonkeyShed if no-one was there.

This is a picture of his paddock.

And this is what it looks like from the air.

Finally there was Brother **Enot**. He was not sociable. He did not like company. He wanted to be left alone to think mathematical thoughts. So he blocked one of his gates to restrict the number of people who could come to see him. And when that gate was closed, he left his DonkeyShed door open so as to pretend that "his door was always open". However, when anyone did come to see him, he immediately would close the DonkeyShed door, pretending he was busy. He was a proud donkey and did not want to admit he was not sociable.

This is a picture of his paddock.

And this is what it looks like from the air.

In the meadow also lived Professor Crow, the mathematically inclined aviator. He often flew over the meadow, taking in the vistas and observing all that happened.

There were also the Rabbits, who were good at multiplying and so were very friendly with Professor Crow.

And there were the forgetful cows, who were always being cheated because they had such bad memories. Their broadband bills were always too high and they suspected that the local supermarket was shortchanging them for their milk. They had no way to prove this and they went to Professor Crow and the Mathematical Rabbits to ask for help.

After some thought, Professor Crow had an idea for a device which would solve the so-called Half-Udder problem.

This would use the Donkeys' paddocks and gates as a way for the Cows to add up how much milk they were selling.

"Mooooo!" said the Chief Bovine.

"How can what those silly donkeys do help us with adding up how many udders of milk we have?"

"Ah", replied Professor Crow, in a mathematical tone of voice, "You will see. My colleague rabbits will help demonstrate"

"That we will Professor!" chirped the Rabbits, grinning. They had already worked out what the professor was up to. Because, you see, rabbits were good at adding up. And especially at multiplying.

The Head Mathematical Rabbit, a docent named Fibonacci, organised the rabbits into teams to go to the DonkeySheds. Professor Crow strapped on a video camera and took to the air to film what would happen from above. Because he knew the cows would never remember otherwise.

Since the cows could only remember 2 bits of information at a time, Fibonacci calculated that they would need to use eight cows for each stage. The total output of the farm was less than 200 udders per day.

Notes:
The Mathematical Rabbits

Wear Flip Flops while working on the Half-Udder problem

Sketch out the solution at the Truth Table - a picnic table popular with Professor Crow and the Rabbits