

# Basic Logic

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- My teacher said we would have a test today, rain or shine.
- Then why are you so happy?
- Because it's snowing.

## Class Discussion

Statements, truth tables, logic operations: and, or, not, if.

## Warm-Up

**Exercise 1.** Mary's mom has four children. The first child is called April. The second May. The third June. What is the name of the fourth child?

**Exercise 2.** Pete was walking with a dog. A stranger asked him: "Does your dog bite?" "Nope," replied Pete. The dog then bit the stranger on his leg, yet Pete told the truth. Explain!

## Logic

**Exercise 3.** Clarence's favorite prank is to switch the signs on fish barrels. Today he mixed up the signs on the carp barrel, the catfish barrel, and the carp-and-catfish barrel, deliberately handing each sign on the wrong barrel. Clarence will let you see only one fish, but it can be from any barrel you choose. Using only this information, can you restore the signs to their rightful barrels? How?

**Exercise 4.** The pups dug into dinner. Polaris ate more than Sirius; Castor ate less than Pollux; Pollux ate less than Sirius but more than Rigel. Which pup ate the second most?

**Exercise 5.** Wendy has cats. All but two of them are Siamese, all but two of them are Persian, and all but two of them are Maine Coon. How many cats does Wendy have altogether?

**Exercise 6.** Yesterday I decided to relax before my energy-consuming work-day at AMSA. I decided to read a book or, if it is not raining, to go for a walk. I didn't go for a walk. Was it raining yesterday?

**Exercise 7.** What happens if an irresistible cannonball hits an immovable post?

**Exercise 8.** Two men were being tried for murder. The jury found one of them guilty and the other one not guilty. The judge turned to the guilty one and said: "This is the strangest case I have ever come across! Though your guilt has been established beyond any reasonable doubts, the law compels me to set you free."

How do you explain this?

**Exercise 9.** On prom night, the young ladies Rose, Daisy, and Iris gathered to get their picture taken. While posing, the girl wearing the rose corsage said, "I just noticed that the flowers in our corsages match our names, but none of us are wearing a flower that matches our own name." "Wow!" said Iris, "You're right!" Given these clues, can you identify what flower every girl was wearing?

**Exercise 10. 1999 AMC 8, Problem 6.** Boe, Coe, Flo, Joe, and Moe have different amounts of money. Neither Jo nor Boe has as much money as Flo. Both Boe and Coe have more than Moe. Joe has more than Moe, but less than Boe. Who has the least amount of money?

## Challenge Problems

**Exercise 11.** A man was looking at a portrait. Someone asked him, "Whose picture are you looking at?" He replied: "Brothers and sisters have I none, but this man's father is my father's son."

Whose picture was the man looking at?

**Exercise 12.** A man was looking at a portrait. Someone asked him, "Whose picture are you looking at?" He replied: "Brothers and sisters have I none, but this man's son is my father's son."

Whose picture was the man looking at?