

## Mathletes Problem of the Week #5

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### Accio Harry!

Tucked away in a secret corridor of Hogwarts School of Witchcraft and Wizardry, there are a number of magical closet doors. If you open one of these closet doors, you might find Harry Potter. Or you might find Voldemort. Because Hogwarts is a magical place, you might find Harry behind multiple doors or Voldemort behind multiple doors. Luckily, Professor Snape has put a sign on each door telling you what's inside, but not all of the signs are true!

a) When you enter the secret hall, you encounter two closet doors. "One of the signs is true," says Professor Snape, "and the other is false." Which door should you open? Why?

I  
Harry Potter is behind this door. Voldemort is behind the other one.

II  
Harry Potter is behind one of these doors. Voldemort is behind the other.

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b) The next time you enter the secret hall, you encounter two closet doors again. "This time, either both signs are true or both signs are false," says Snape. Which door should you open? Why?

I  
Harry Potter is behind at least one of these doors.

II  
Voldemort is behind the other door.

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c) This time Snape is standing outside three different closet doors. He tells you that Harry Potter is behind only one door and Voldemort is behind the other two doors, so choose carefully! He also tells you that the sign on Harry Potter's door is true and at least one of the other two signs is false. Which door should you open? Why?

I  
Voldemort is behind door II.

II  
Voldemort is in this room.

III  
Voldemort is in room I.

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**Solutions & Explanations:** (Solve one or more. Record your solutions on the back. Attach more paper if you need to.)

Name \_\_\_\_\_ Class \_\_\_\_\_

(First and last name, please!)

Solutions due: November 16<sup>th</sup>