

**Thurd Thursday #2: Eyeball Continues His Inexorable March Towards Death**

*Write your answer at the top of your answer sheet (next to the IOQ).*

*Correct answers are worth an additional 2 points.*

Eyeball's friends Ajax and Ulysses wanted to know when his birthday was, so they asked him one day. Instead of just telling them like a normal person, he showed them this chart:

<i>June</i>		25	26	
<i>July</i>		22	24	
<i>August</i>		22	23	25
<i>September</i>		23	24	27

"These are the ten possible choices for my birthday," Eyeball told them. He then separately told Ajax and Ulysses the month and date of his birthday, respectively.

Ajax: "I don't know when Eyeball's birthday is, but I know that Ulysses doesn't either."

Ulysses: "At first I didn't know when Eyeball's birthday is, but I know now!"

Ajax: "Then I also know when Eyeball's birthday is!"

So, when is Eyeball's birthday?

**Answer**

Ajax instantly *knows* that Ulysses doesn't know Eyeball's birthday. So, Ajax knows that every number that is listed as a possibility within the month that he was told is *also* a choice in another month, which leads him to make his first statement. This rules out June and September, whose unique dates (26 & 27, respectively) would give Ulysses the opportunity to know Eyeball's birthday without any other information. So, from Ajax's first statement, we know that Eyeball's birthday falls in either July or August.

Ulysses, upon this new information received, announces that he now knows Eyeball's birthday. So, the number that Ulysses was told must be a *unique* number within July and August. This means that the number cannot be 22.

Knowing that the number cannot be 22, Ajax announces that *he* now knows Eyeball's birthday. If Ajax were told that Eyeball's birthday occurred in August, the fact that it didn't occur on the 22nd would be of little help in certifying the exact date. However, if Ajax were told that the birthday occurs in July, then the fact that it is *not* on the 22nd would be enough to verify that it *is* on the 24th. In other words, the only way that Ajax can be so certain is if the birthday occurs in July.

And, indeed, that is when Eyeball's birthday is: the 24th of July.