

Brief Summary of Logic and Logical Faults

I. **Logic:** a word that means

- good reasoning, the art of reason, sensibleness, sound arguments, common sense
- math is like logic in many ways; equations that are correct (for example, $2 + 2 = 4$) are logical; equations that are incorrect (for example, $2 + 2 = 5$) are illogical

II. Logical Faults to Avoid (and to point out if others make them):

1. **Vague, obscure, non-specific arguing**

You commit this logical fault when you claim something is true without giving any specific evidence to support your claim. For example, if you argue that " $2 + 2 = 4$ because generally you think that $2 + 2 = 4$ " you would not be offering any evidence to prove that $2 + 2 = 4$, and would commit the logical fault of vague, obscure, non-specific arguing.

2. **Begging the Question**

You commit this logical fault when you claim something is true because it is true, without giving any evidence to support your claim. For example, if you argue that "surely $2 + 2 = 4$ " you would not be offering any evidence to prove that $2 + 2 = 4$, and would commit the logical fault of *begging the question*.

If you are debating with someone and they only say "Surely such and such is true" you will know that they don't have any evidence and are just trying to convince you by using the word "Surely" or "Clearly".

3. **Ad hominem (Attacking the person)**

You commit this logical fault when you attack the person you are debating in an irrelevant way, rather than attacking their argument. For example, if you are debating someone and they say " $2 + 2 = 4$ " and you say "That's wrong because that person is silly" you would commit the logical fault of *Ad hominem*.

Sometimes it is relevant to attack the person, for example if they are biased or lack experience in the area you are talking about, but it is almost always better to attack their argument, rather than attacking the person.

4. **False Analogy**

You commit this logical fault when you claim something is true using an example that is different and not connected to what you are saying is true. For example, if you argue that " $2 + 2 = 4$ because "apples + oranges = grapes" you would be using an incorrect example and would commit the logical fault of *false analogy*.

5. Straw Man (Setting up an argument so you can knock it down easily)

This logical fault is connected to the false analogy fault, only it is usually committed when you are attacking another person's argument. You commit this logical fault when you claim your opponent's argument is false using an example that makes it seem like your opponent's argument is silly, even though it isn't. For example, if you argue that "my opponent's argument that $2 + 2 = 4$ is false because if we believe that then we have to believe that $3 + 5 = 4$ " you would be setting up your opponent's argument in a way that makes it seem silly just so you can then knock down their argument, even though their argument is not silly at all.

6. Red Herring (Changing the subject)

You commit this logical fault when you claim something is true using an example that does not relate at all to what you are saying is true. For example, if you argue that " $2 + 2 = 4$ because everything in the world is beautiful" you would be using an example that completely changes the subject and you would commit the logical fault of *red herring*.

7. Illegitimate Appeal to Authority

You commit this logical fault when you claim something is true simply because someone recognized by many people says it's true, even if that person actually has no expertise in the area. For example, if you argue that " $2 + 2 = 4$ because The Backstreet Boys say so" you would be saying that a mathematical equation is true because a singing group, who are not mathematicians, says so.

It is fine to support your argument by stating that someone else supports your argument, but only if they are an expert in the topic you are arguing about.

8. Appeal to Emotion / Pity

You commit this logical fault when you claim something is true because it would be sad or disappointing if it wasn't true. For example, if you argue that "we have to believe that $2 + 2 = 4$ because if we don't the world will be a much sadder place to live in" you would be appealing to emotions, instead of using logical arguments, to support your claim.

It is fine to appeal to emotions in how you deliver your argument, to be passionate and show that you believe what you are saying. But it is illogical to use only emotion to try to convince others that you are right.

III. Conclusion

Always try to make logical, sensible, reasonable arguments when you are debating, and avoid the 8 logical faults set out above.

Practise recognizing (and avoiding) logical faults when you have discussions or arguments with other people, by reading letters-to-the-editor or editorials in the newspaper, by listening to people discussing issues on the radio, or by watching politicians debating or courtroom TV shows.

The more you practise, the easier it becomes to recognize logical faults, to analyze whether other people's arguments are reasonable, and to avoid logical faults yourself.