Is Math invented or discovered? Is Math objective or subjective? The Kantian way

Usually, in attempting to answer the question "Is Math invented or discovered?", a simple way to go about this is to simply try and show that Math is either objective or subjective (and not both). The reasoning behind this is clear enough: if objective, it seems to point to the fact that Math is discovered while if subjective, it seems to point to the fact that Math is invented.

This dichotomy, while simple and useful in preventing any confusion, is unfortunately, a false one. This is because there is at least one more possible position – the middle path – posited no less by Immanuel Kant.

To understand this position fully, we must keep Kant's project in mind.

Recall that Kant thought that the epistemologies posited by the Rationalists and the Empiricists were both flawed. This was essentially because in order to have meaningful and contentful thinking, one must have both content and concepts where the concepts are applied to the content to make sense of it. Hence, for the Rationalist, Kant thought that though the mind does indeed require concepts and understanding to make sense of data, the main problem was where the data comes from if it did not come from the external world. In other words, concepts without any content are empty. For the Empiricist, Kant thought that the blank slate theory was wrong; one can have data but if one does not have the concepts to make sense of the data, then the data would just be a mish-mash of content. Since our knowledge is not a mish-mash of content but content that has been meaningfully arranged and classified, then it necessarily means that our content has had concepts applied to it by the mind. In other words, content without concepts is 'blind' or just 'noise'.

Keeping this in mind, Kant posited his famous filters of consciousness.

Previously, we learnt that these filters of consciousness included space, time and causality. While this is correct, it over-simplifies Kant's thinking. Here is (hopefully) a more accurate version of Kant's argument.

Kant thought that there were 2 kinds of filters of consciousness: the Forms of Sensibilities and the Forms of Understanding.

The Forms of Sensibilities are what allows the mind to receive data from the Noumenal World. There are only 2 forms of sensibilities: Space and Time (Causality is a Form of Understanding). In essence, these forms of sensibilities are what provide the mind with content.

The Forms of Understanding are what allows the mind to make sense of the data that it receives from the Noumenal World. There is no need to know what these are (there are altogether 12 here, of which Causality is one of them). The most important thing to take note of is that these Forms of Understanding fall into 3 kinds of categories: Dynamic, Mathematics, and the last which is a combination of the 2 (no name was given in the book I'm referring to). Essentially, these forms of understanding are the concepts the mind applies to the content it gets from the forms of sensibilities in order to arrive at knowledge.

So in mathematical equation form:

Knowledge = The Phenomenal World as revealed by the Forms of Sensibilities + the Forms of Understanding applied onto the Phenomenal World.

Here is an analogy that hopefully captures Kant's thinking.

Imagine you are packing your room, getting ready to move to a new house. You have a box and you wish to put your things in it. One way is to simply dump all your things into the box without any regard to classifying and recording what goes in there. What happens then is that you probably forgot what went in there and when you open the box and look at it, it just looks like a mess. In other words, you cannot make any sense of it. However, imagine that you have now learnt your lesson. So you start to re-arrange the things in the box such that it becomes a lot neater. For example, the big and hard things go in first, while the small and soft things go in last. This way, you know where your things are.

The mind is like a box. The Forms of Sensibilities go out and retrieve data from the Noumenal World and puts the data into the box. However, if the data is just thrown into the box without any kind of conceptual thinking of how to put what things where, it just is a mess and you cannot make any sense of it. This was Kant's objection to the Empiricist Blank Slate theory (how do you make sense of things without any innate concepts built in?). Once the data is in the box, then the Forms of Understanding is applied onto the data in order to categorise the data, classify it and make sense of it. It is only then that Knowledge is reached.

It is important to note Kant's justification for his argument. In effect, his argument is what you might call an Inference to Best Explanation (IBE). Kant's argument is of the following form: P1: I have experience

P2: If I have experience, then I must have the conditions necessary for experience, i.e. filters of consciousness.

C: I have the conditions necessary for experience, i.e. filters of consciousness. (P1-2)

Why is this an IBE? Because it simply supposes that the best explanation for why we have experience is just P2. Without P2, it supposes that experience is not possible, or at least not understandable. In other words, this is a transcendental argument.

Is this then a good argument if it is only an IBE?

Why not? This is possibly the best explanation to make sense of both the Rationalist and the Empiricist schools of thought. In justifying Kant's position, one must also see how he solves the problems faced by both schools and found a way to reconcile the 2 together.

Coming back to Knowledge and Mathematics, the upshot of Kant's filters of consciousness is this:

- 1) The Phenomenal World as CONSTITUTED by the mind (remember that unlike the Rationalist and the Empiricist, Kant thought that the mind is an Active Constituter of Phenomena) is constituted in Space and Time.
- 2) The mind NECESSARILY understands the Phenomenal World in the 3 categories of Understanding: Dynamic, Mathematics, and the Combination of the 2.
- 3) This is NOT to say that mathematical KNOWLEDGE is a filter of consciousness! Remember that for KNOWLEDGE to occur, the Forms of Sensibilities and Understanding must work together. What this means is that we understand the Phenomenal World Mathematically.

What this means for the question whether Mathematics is invented or discovered is that Mathematical KNOWLEDGE is then necessarily CONSTRUCTED by the mind and NOT

discovered. This is because the mind CONSTRUCTS the Phenomenal World and all knowledge we have is ONLY of the Phenomenal World.

Yet Mathematics for Kant is also OBJECTIVE. Why? To understand this, we need to remember that the traditional sense of objective is that it exists independently of human minds and is thus able to guarantee non-bias. For example, in Science, we can point to the mind-independent empirical evidence that is supposed to (but doesn't actually) objectively determine our theory choice, i.e. without bias.

Here, Kant's 'middle way' is not trying to achieve the same level of 'objectivity', as it were. Instead, what he is saying is that mathematical knowledge, though subjective because it is a matter of human invention, is nonetheless certain and non-biased. It is this certainty and nonbias of mathematical knowledge that makes it objective in a non-traditional sense.

Why is it certain? Because it is synthetic A PRIORI. And a priori claims are certain because it consists with necessary relations, unlike a posteriori claims which consist of merely contingent relationships.

And how can math be non-biased since it is literally a human invention and has the human lens imposed onto it? Because Kant thought that his filters of consciousness were the same for EVERYONE, i.e. that it is UNIVERSAL for human minds (hence it is not universal in the traditional sense of it applying to any sentient beings at any space and at any time). In other words, math IS biased but it is UNIVERSALLY biased such that the charge of prejudice makes no sense. Thus, ANY knowledge (and not opinions or conjectures) that we have as human beings is 'universal' in this non-traditional sense.

So, the middle way! Mathematics is BOTH constructed AND objective.

The same goes for the other areas of knowledge like Science and Ethics.

Kant wanted to rescue Newtonian Science from Humean Skepticism. Hence, instead of Constant Conjunction and the Problem of Induction, Kant said that we necessarily understand the world in CAUSAL relations (which is obviously a filter of consciousness). Thus, for Kant, Newtonian Science is also objective and constructed. How else, Kant might say, would we be able to walk without bumping into each other all the time if we did not operate on the same kind of space- time reality? (So Kant also thinks that Euclidean Space is objective.) While this position now seems untenable due to the emergence of Riemannian Geometry and Einsteinian space-time curvature, Kant could well have said that he was simply wrong about what he thought was knowledge, i.e. that the Newtonian paradigm was the WRONG one he was fighting for, and that there is still ONLY one particular paradigm to be had. Hence, Science for him would still be objective. And since Scientific Knowledge is of the Phenomenal World which is CONSTRUCTED by the mind, then Scientific Knowledge (and not opinion or conjecture) is both Objective and Constructed.

Same too for Ethical Knowledge. Recall how he thought that any conflict of duties was only because we were not enlightened enough. Kant thought that EVERYONE could reach that objective set of moral rules as long as they put their heart into unleashing the potential of their rationality. Again, Ethical Knowledge, as all other areas of knowledge for Kant, is both objective and constructed as well.

Is Ethical Knowledge then a SOCIAL construct? Yes, BUT only in the sense of UNIVERSAL construct and not that each society can construct its own ethical knowledge.

Is it PRAGMATIC? Necessarily so because it is knowledge of the Phenomenal World and ANY knowledge, according to Kant, is good.

NOTE: This is only MY reading of Kant. It sounds logical enough to me but do be prepared should I come back next time and revamp it again.