DRP WEEK 1

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Question 1. What is a group? Give three examples.

Question 2. Can groups have finitely many elements?[1] If so, give an example.

Question 3. Can groups have infinitely many elements?[2] If so, give an example.

Question 4. What is a subgroup? Give three examples.

Question 5. What is a group homomorphism. Give an example of the following things (if you don't think such an example exists, try to prove it!)

(i) a group homomorphism from a finite group to a finite group,
(ii) a group homomorphism from an infinite group to an infinite group,
(iii) a group homomorphism from an infinite group to a finite group,
(iv) a group homomorphism from a finite group to an infinite group, and
(v) a function between two groups which is not a group homomorphism.

Question 6. Let G be a group. Consider two group homomorphisms $f : G \to G$, and $g : G \to G$. We can compose these functions to get a function $g \circ f : G \to G$. Is $g \circ f$ a group homomorphism?

I would also like you to come up with at least three questions for me. If you have clarifying questions such as "what does this sentence mean?" or "what is this symbol?" or whatever then that is of course great, but if you answer all of the questions I gave you and find yourself without three questions for me, consider forming questions of the form "how should I think about _____?"[3]

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[1]This is called a finite group.

[2]This is called an infinite group.

[3]After all, questions of this form can sometimes be the most enlightening!