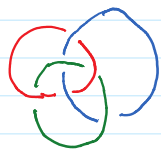


Tutorials rooms on web by midnight!

HW1 on web by midnight!

Read Along. Appendices A-D. (still)

Riddle Along.



Can you draw 4 linked loops, so that if you drop any one of them, the remaining 3 are not linked?

Today's menu. Field generalities, The complex numbers.

Thm 1. $a+b=c+b \Rightarrow a=c$ 2. $b \neq 0, a \cdot b = c \cdot b \Rightarrow a=c$

3. "0 is unique" 4. "1 is unique"

5. " $-a$ is unique" 6. " a^{-1} is unique"

7. $-(-a) = a, (a^{-1})^{-1} = a$

start
line

$a-b$ & a/b can be defined.

8. $a \cdot 0 = 0$ \leftarrow Hard!

9. There's no 0^{-1}

10. $(-a) \cdot b = a \cdot (-b) = -(a \cdot b)$

11. $(-a)(-b) = a \cdot b$

12. $ab = 0$ iff $(a=0) \vee (b=0)$

16. $(a+b)(a-b) = a^2 - b^2$

Thm \exists $\chi: \mathbb{Z} \rightarrow F$ s.t. $\chi(0) = 0, \chi(1) = 1$
 $\chi(m+n) = \chi(m) + \chi(n)$
 $\chi(mn) = \chi(m) \cdot \chi(n)$

DCE characteristic

previous theme: "abstraction, generalization, definition, examples,

next: "dream, implications, formalization & proof".

Dream Add to \mathbb{R} some number i so that $i^2 = -1$

Implications must add $7i, 3-7i, (2+3i)(3-7i), (3-7i)^{-1}, \dots$

Formally define \mathbb{C} and verify fieldness.

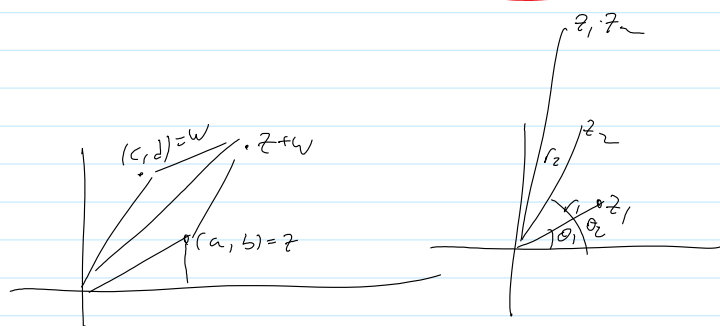
Thm Our definitions indeed make a field!

More fully: There exists a field \mathbb{C} that contains the real numbers and also contains an element i s.t. $i^2 = -1$.

Show "The Complex Numbers by Computer"

2012
like (how 5)

Interpretation



Waves, AC, RLC

$$V = RI$$
$$V = I/C$$

Why aren't we also adding \sqrt{i} ?