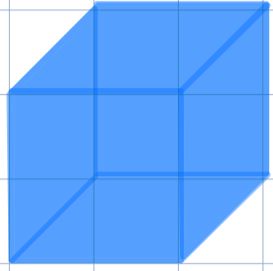
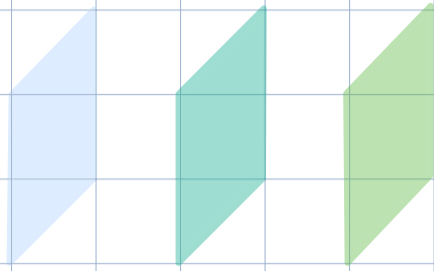


MatCat

dim:



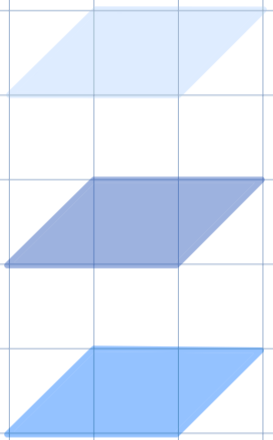
category



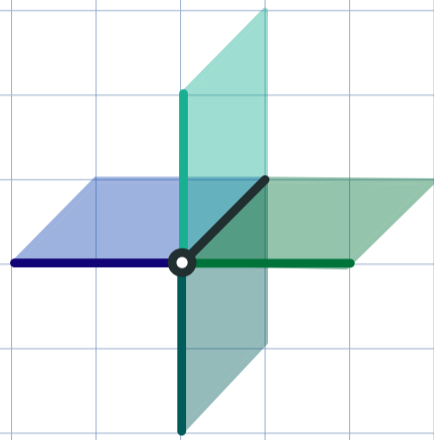
fibered cat

H

V



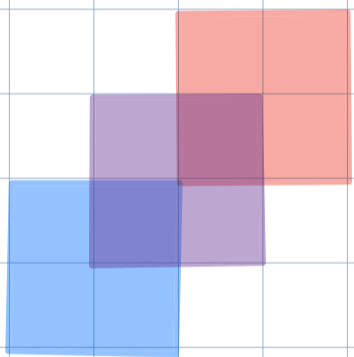
functor



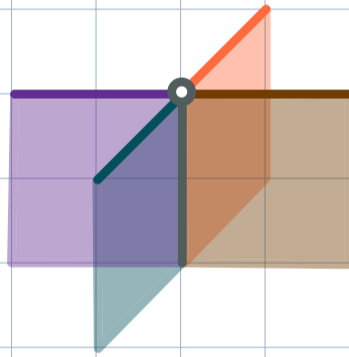
fibered func

\mathcal{U}

T



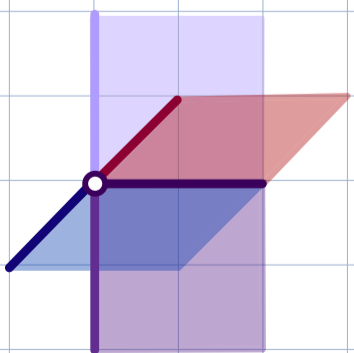
profunctor



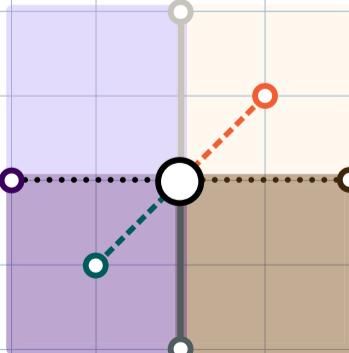
fibered prof

\mathcal{V}

\mathcal{H}^0



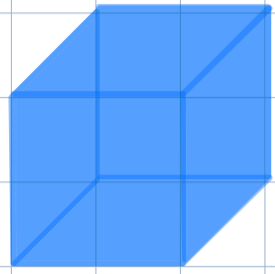
transformation



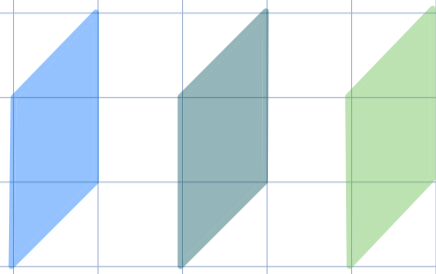
fibered trans

(seen in T)

Logos = Mnd(MatCat)



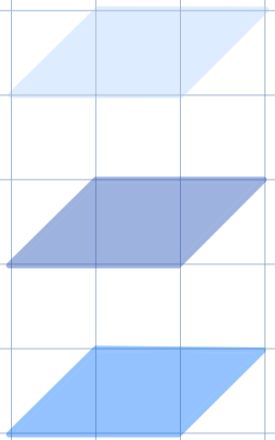
logic
(f.d.c.)



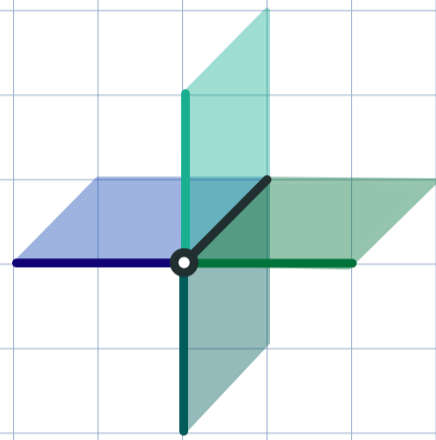
metajudgement
(h. mod.)

H

V



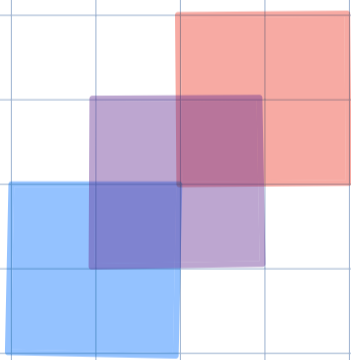
system
(func.)



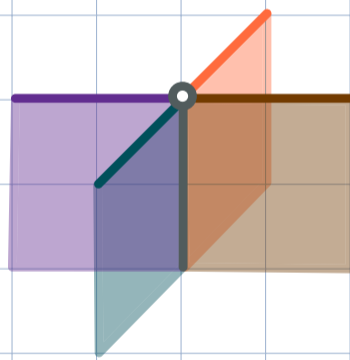
judgement system

$\frac{0}{1}$

T



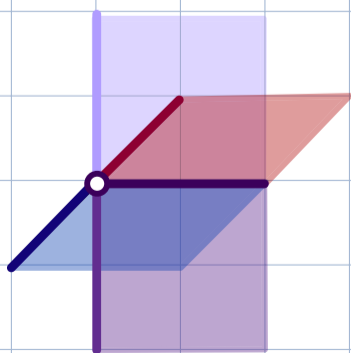
metaterm
(v. mod.)



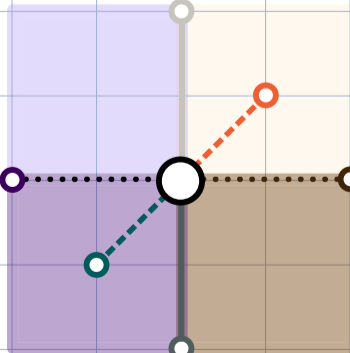
meta-inference

$\frac{0}{1}$

$\overset{0}{H}$



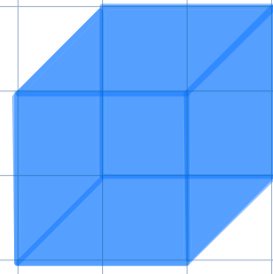
term system
(v. trans.)



inference system
(modification)

(seen
in T)

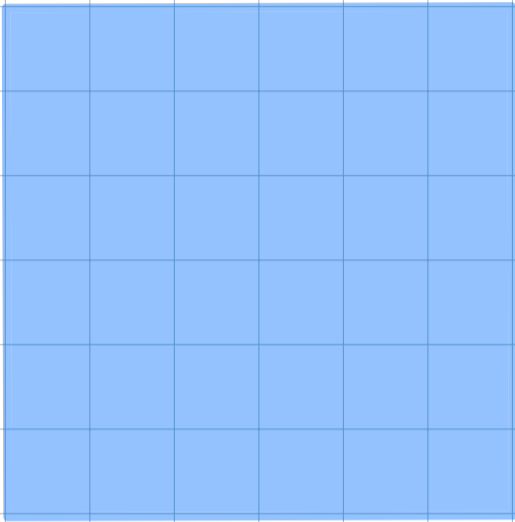
Logic (Fibrant double cut)



[drawn in \mathcal{T}]

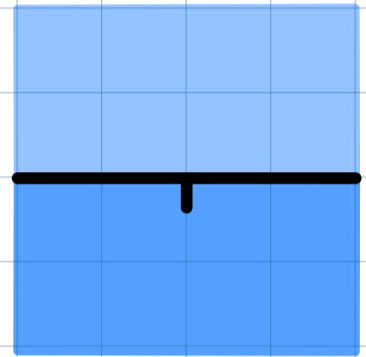
(internal view)
↓

0

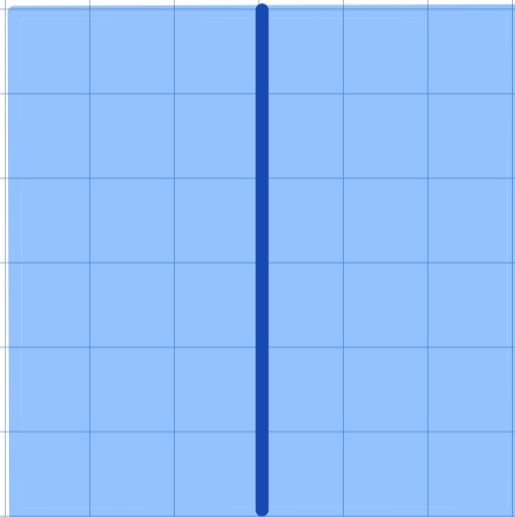


category

types
& terms

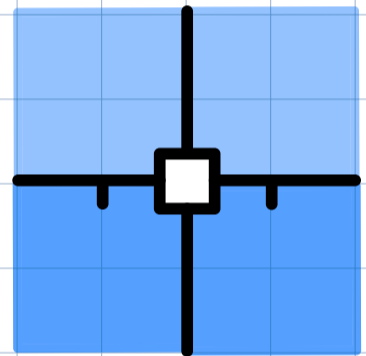


1

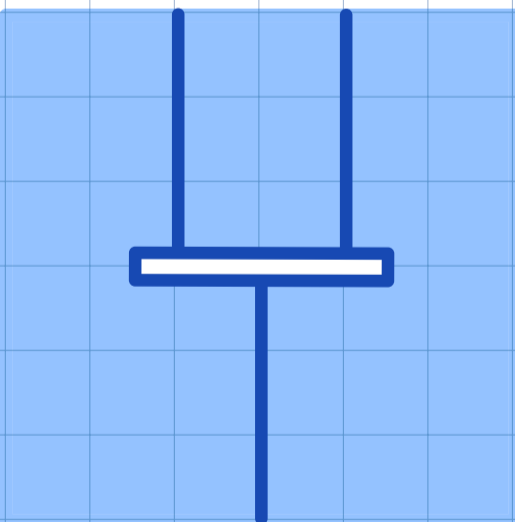


fibred category

judgements
& inferences

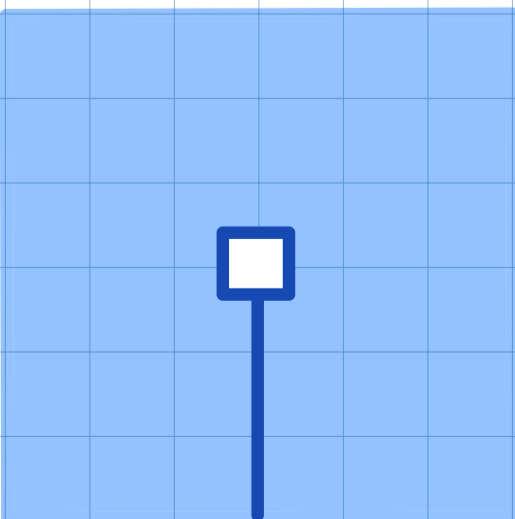
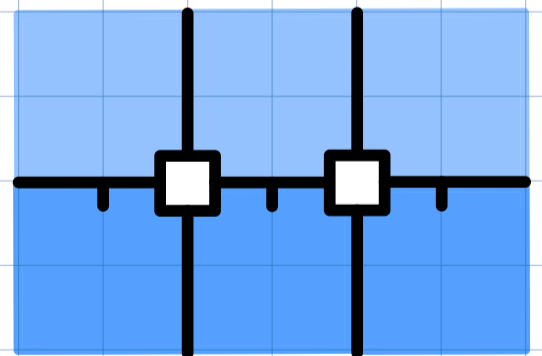


2



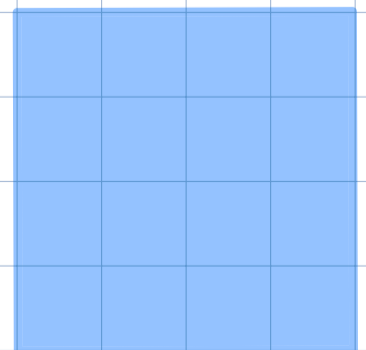
fibred functor

parallel
composition

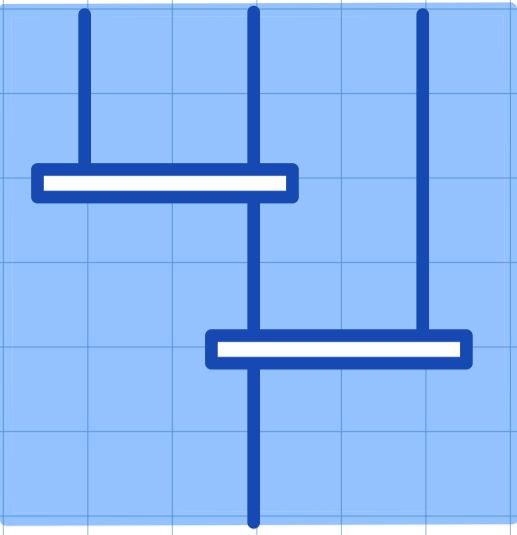


fibred functor

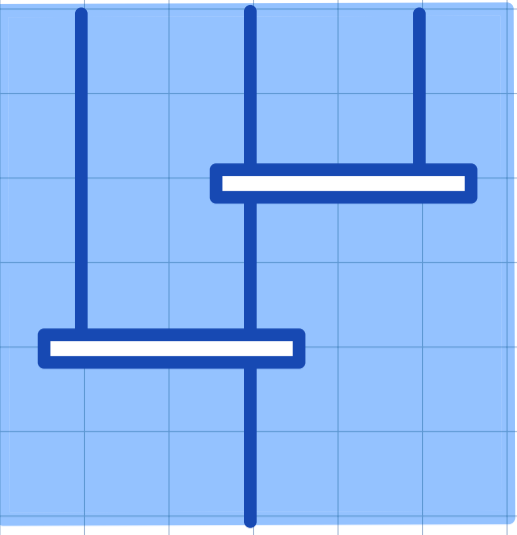
identities



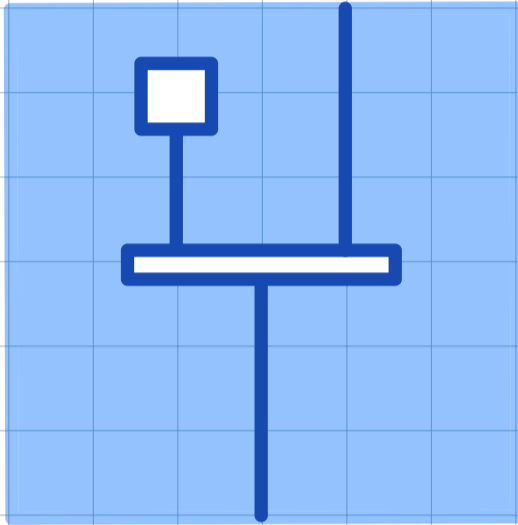
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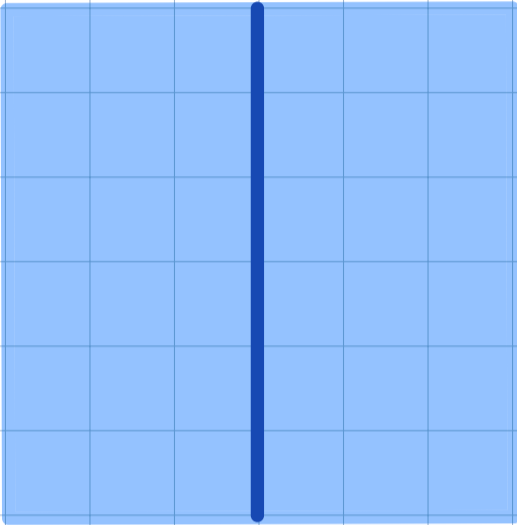
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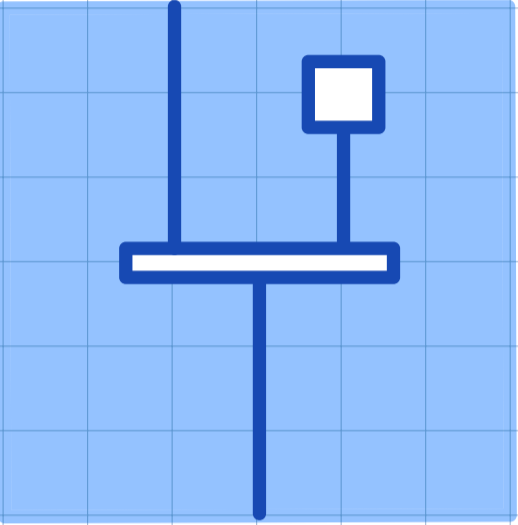
fibred trans
 associator



λ
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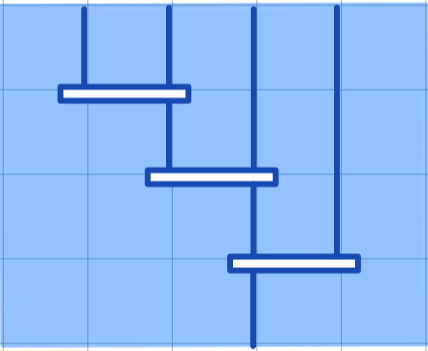
ρ
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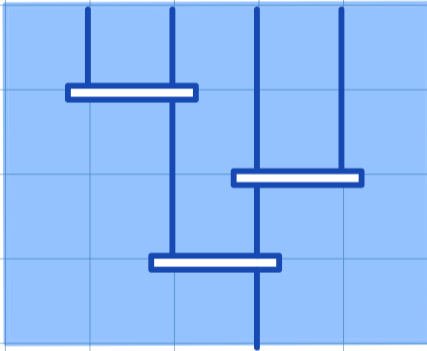
left
 unitor

right
 unitor

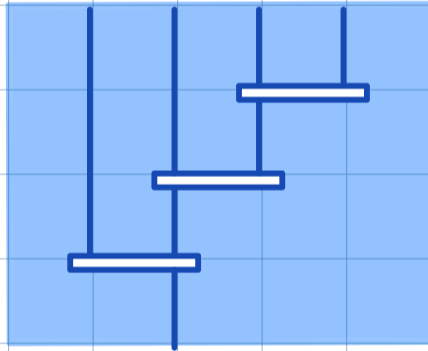
4



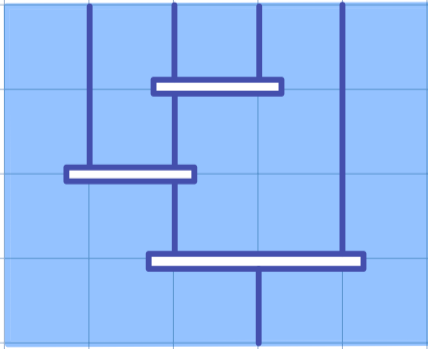
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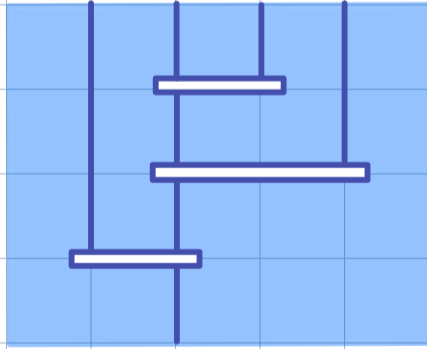
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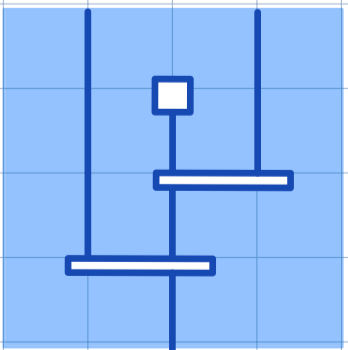
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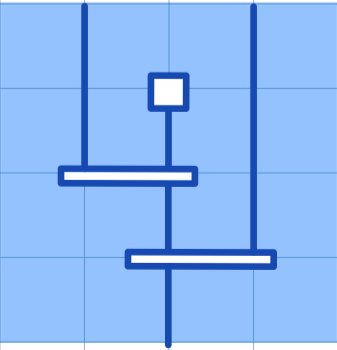
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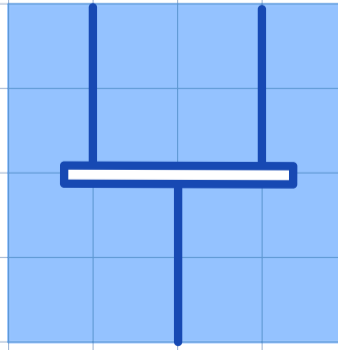
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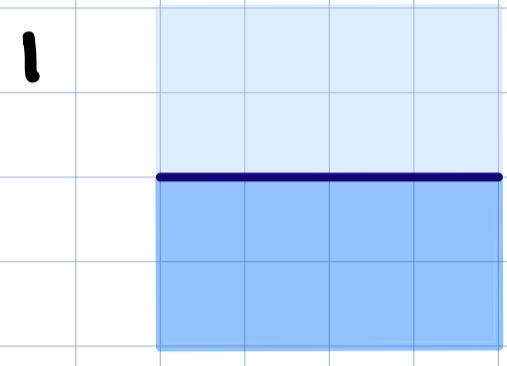
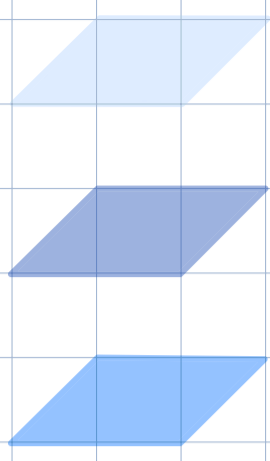


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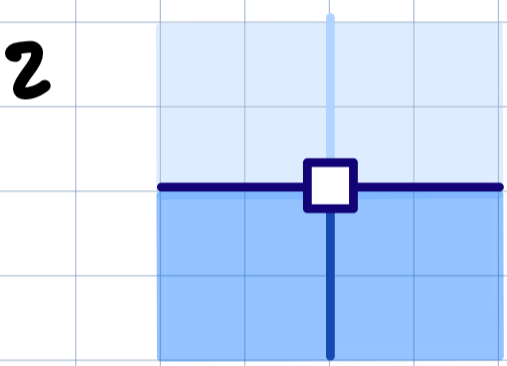
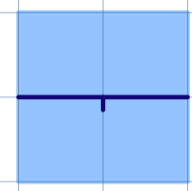


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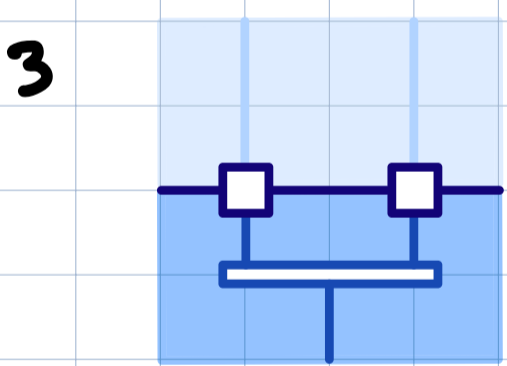
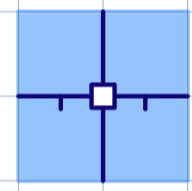
System (Functor)



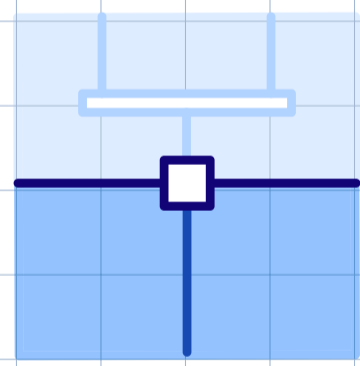
functor
maps T_s & t_s



fibered functor
maps J_s & I_s



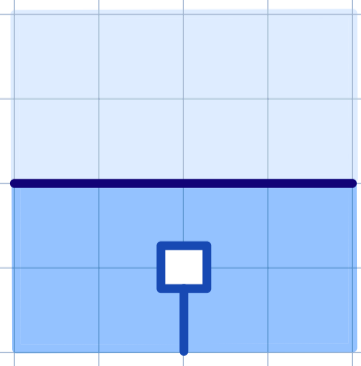
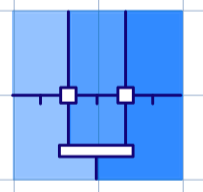
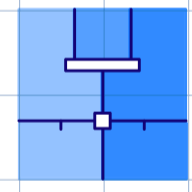
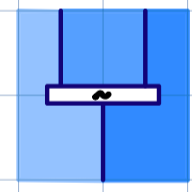
$\xrightarrow{\sim}$



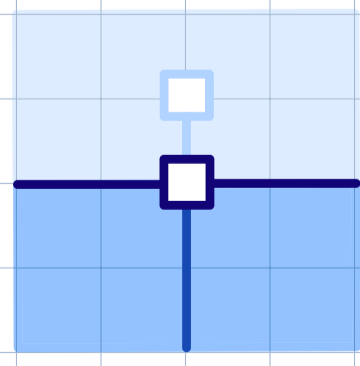
multiplication

preserves
comp

(natural)



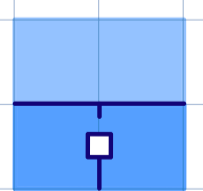
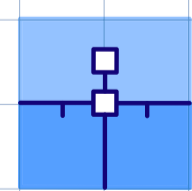
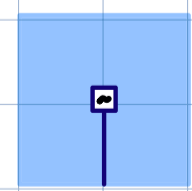
$\xrightarrow{\sim}$



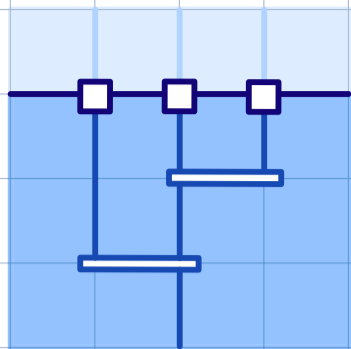
unit

preserves
identities

(natural)

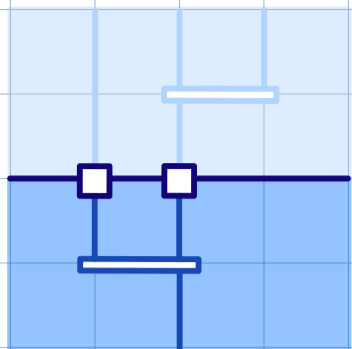


4

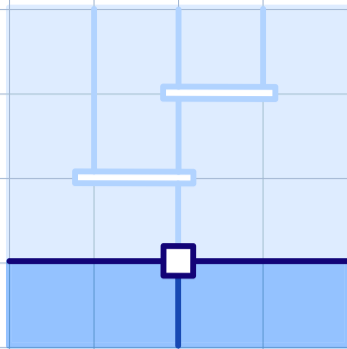


$\alpha \downarrow$

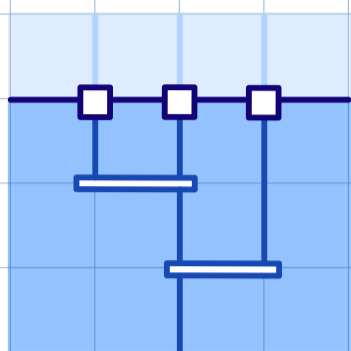
$\mu \rightarrow$



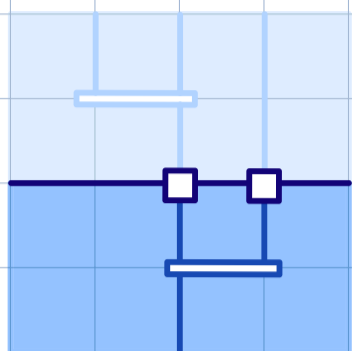
$\mu \rightarrow$



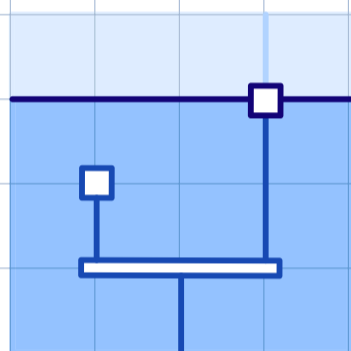
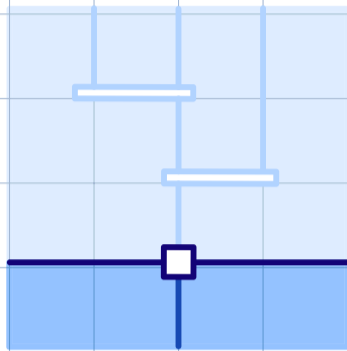
$\downarrow \alpha$



$\mu \rightarrow$

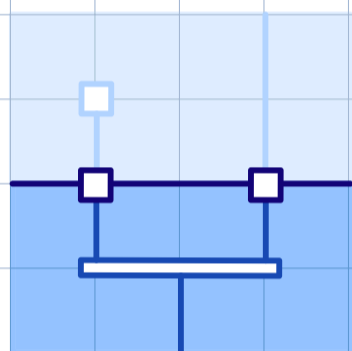


$\mu \rightarrow$

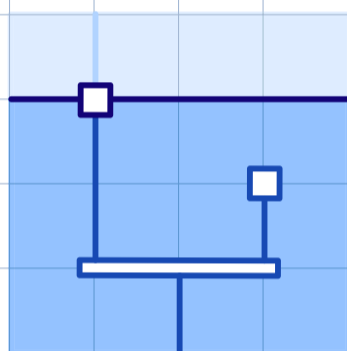


$\lambda \downarrow$

$\lambda \rightarrow$

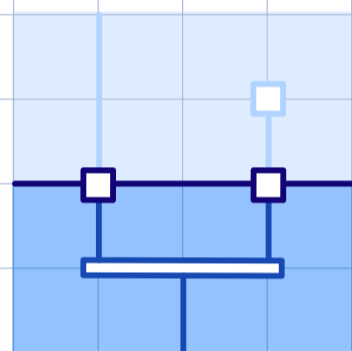


$\downarrow \mu$

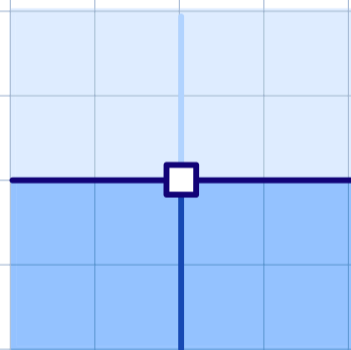


$\rho \downarrow$

$\lambda \rightarrow$

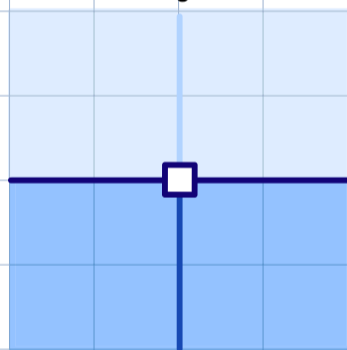
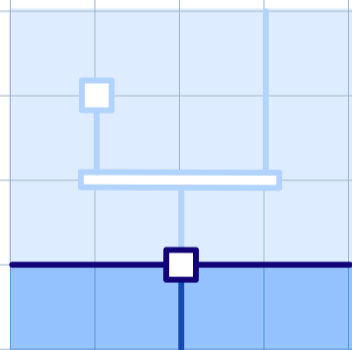


$\downarrow \mu$



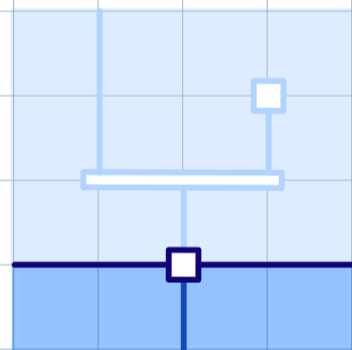
$\lambda \leftarrow$

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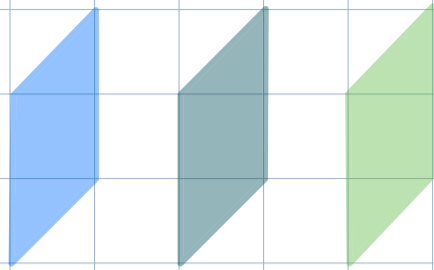


$\rho \leftarrow$

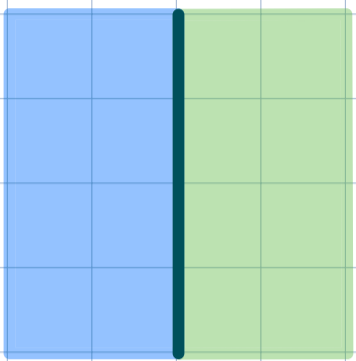
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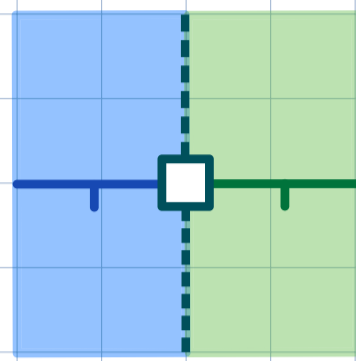
Metajudgement (Horiz / "loose" module)



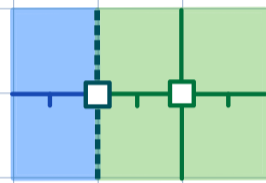
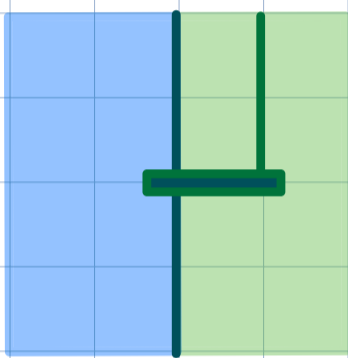
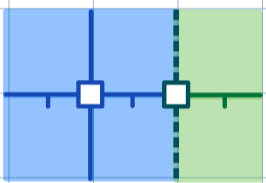
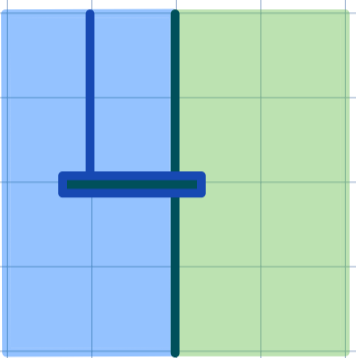
1



fibred category
hetero-judgs & infs



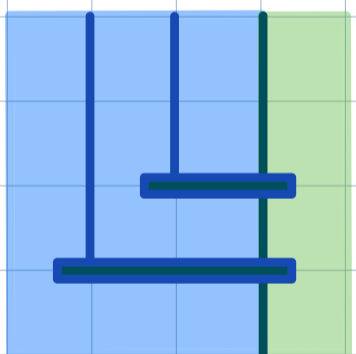
2



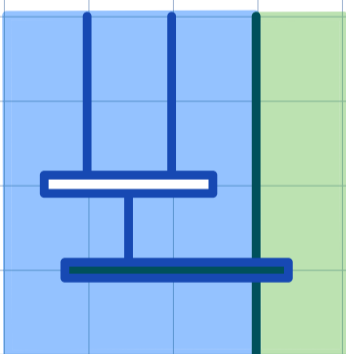
left compose

right compose

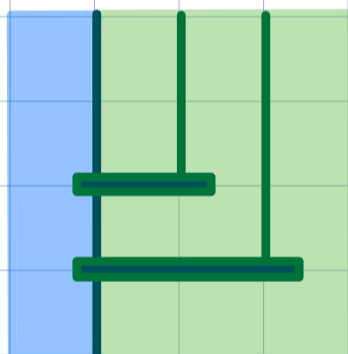
3



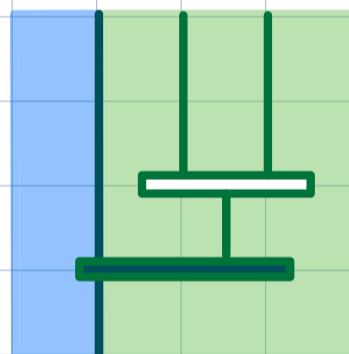
μ_l
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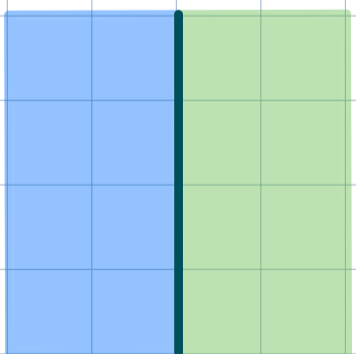
left assoc



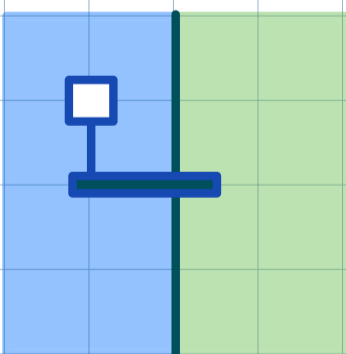
μ_r
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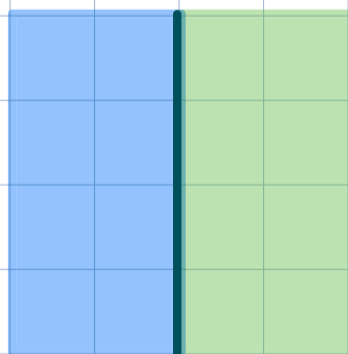
right assoc



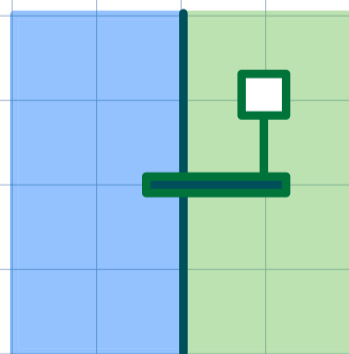
η_l
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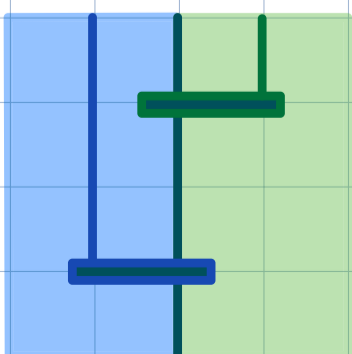
left unit



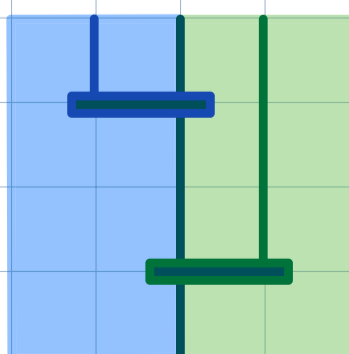
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right unit

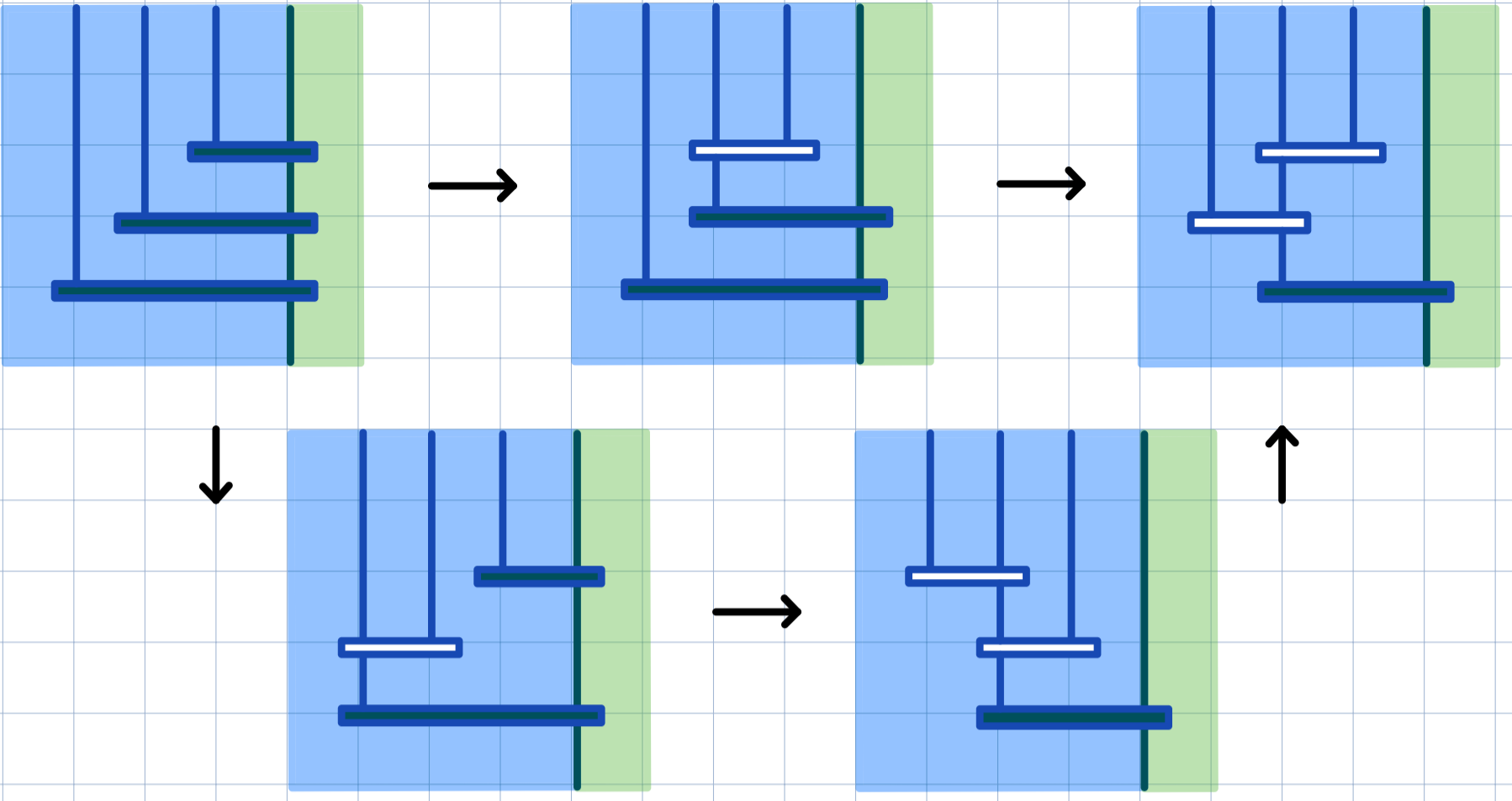


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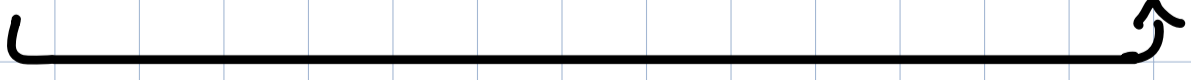
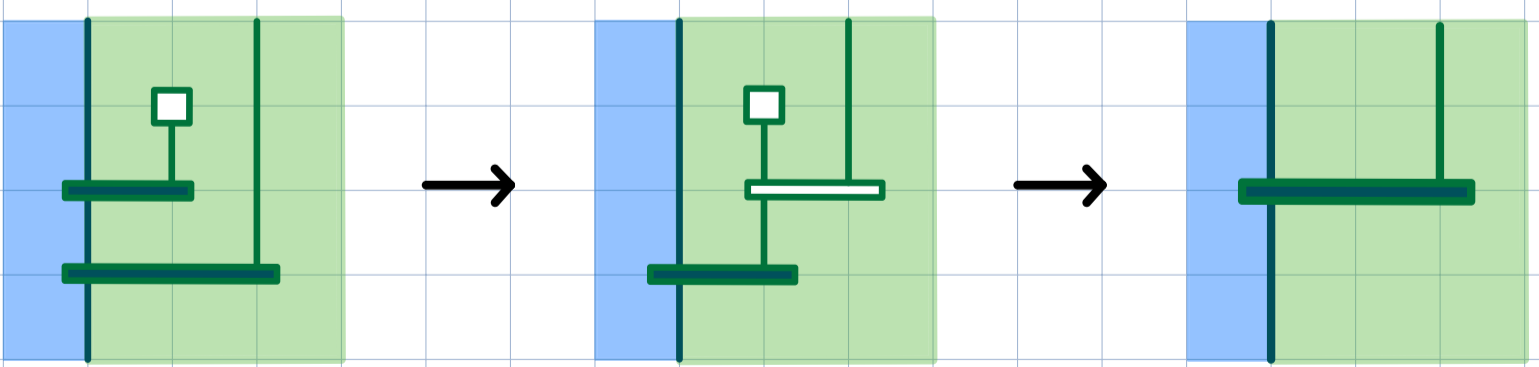
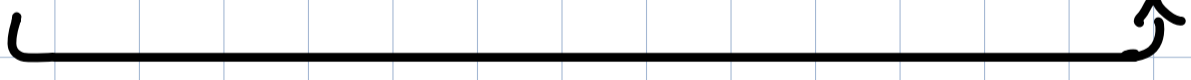
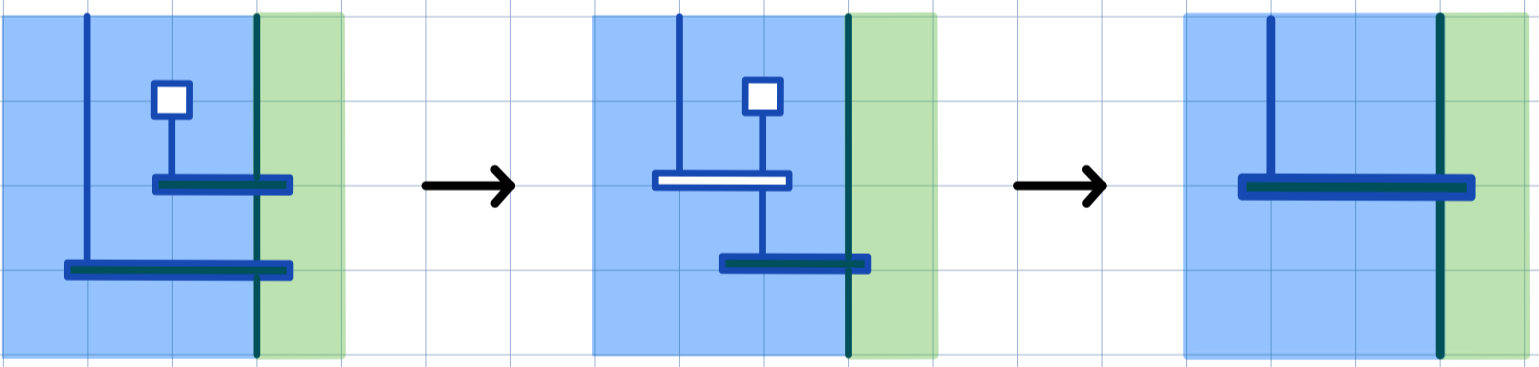
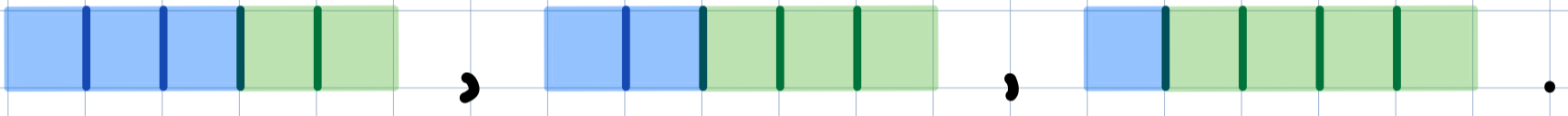


middle
assoc

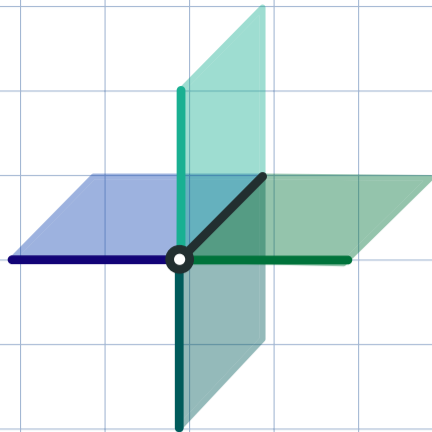
4



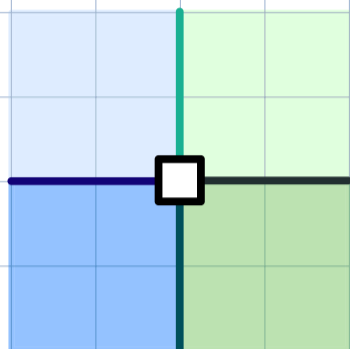
q similarly for



Judgement system (Horiz module transform)

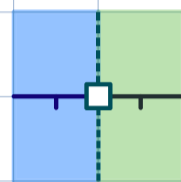


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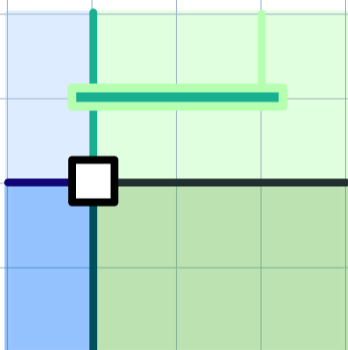
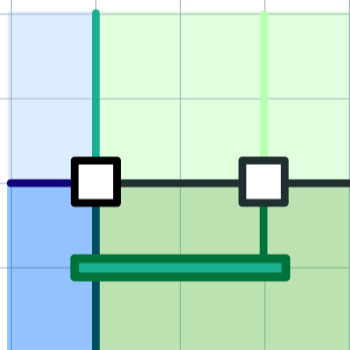


fibered functor

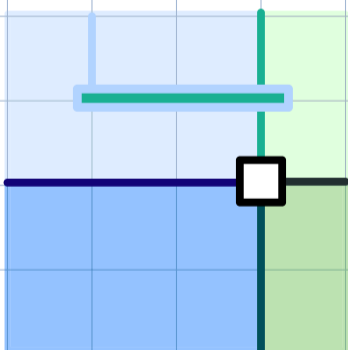
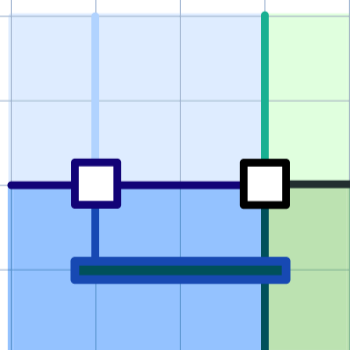
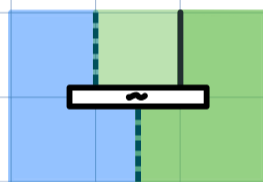
maps hetero J&I s
to hetero J&I s



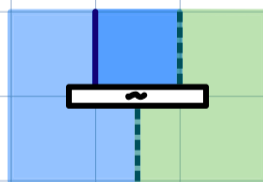
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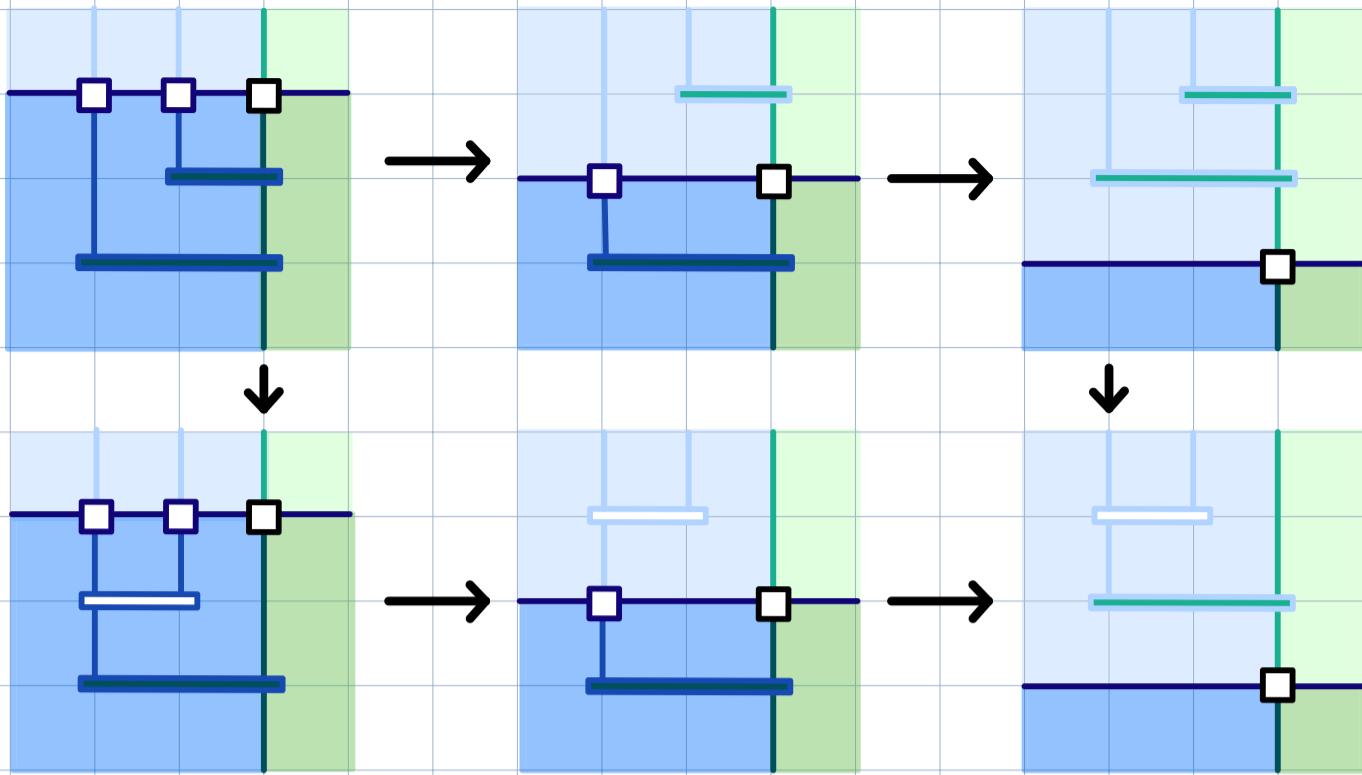
preserves
right compose



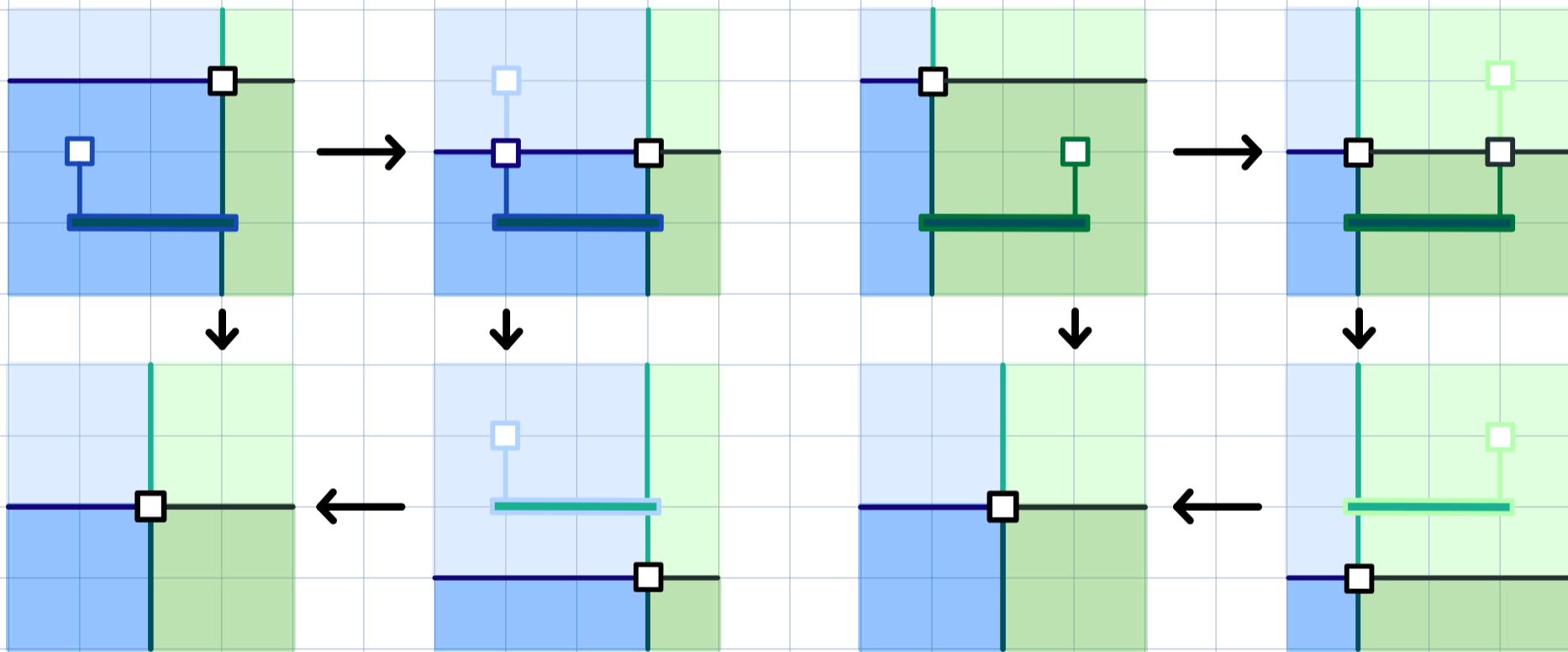
preserves
left compose



4

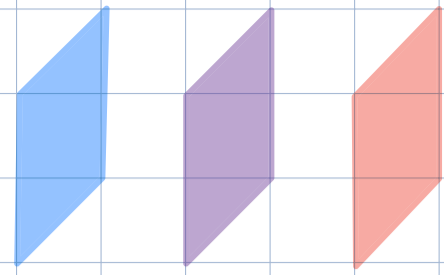


4 same for

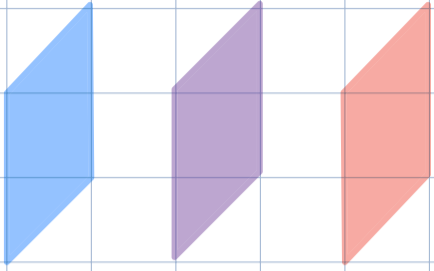


Metaterm

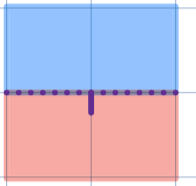
(Vertical / "tight" module)



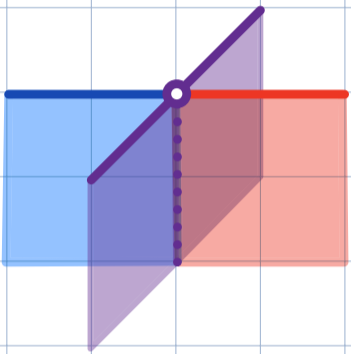
1



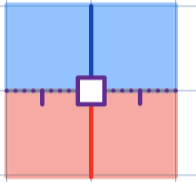
profunctor
hetero-terms



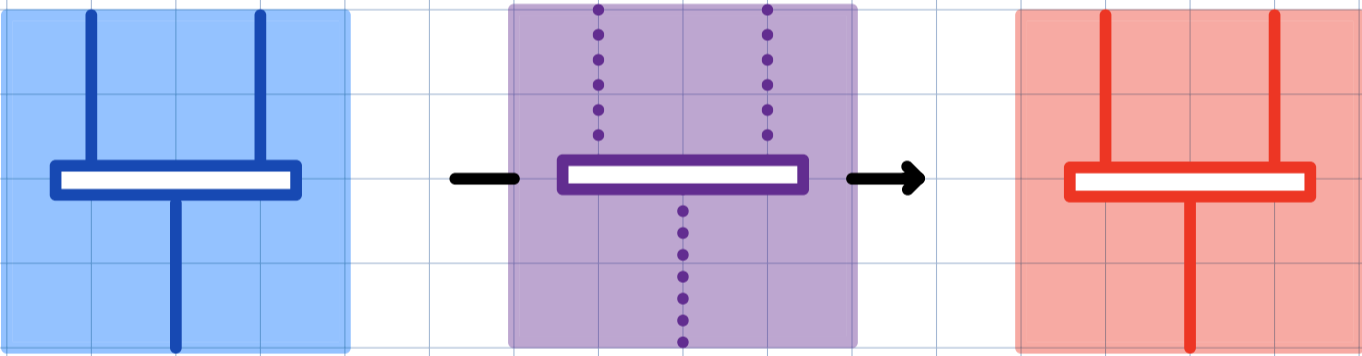
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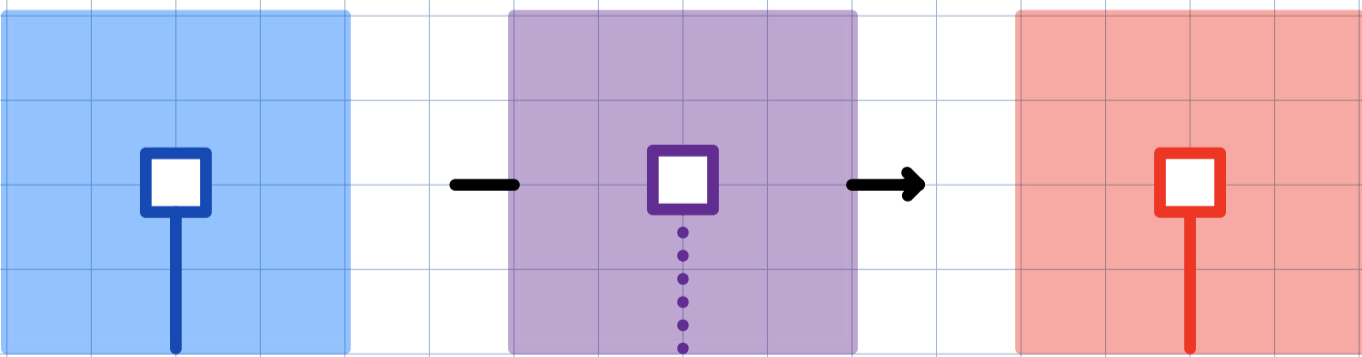
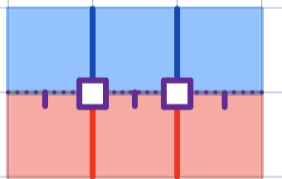
fibered profunctor
hetero-inferences



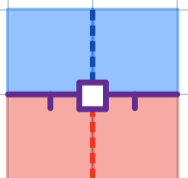
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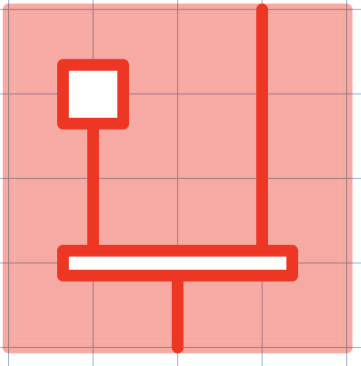
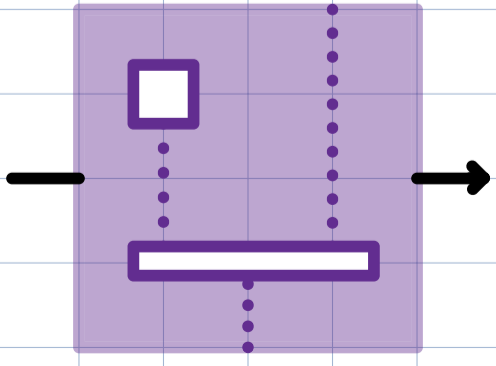
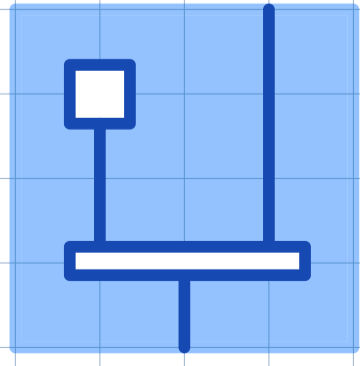
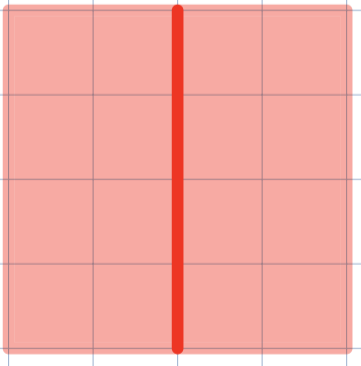
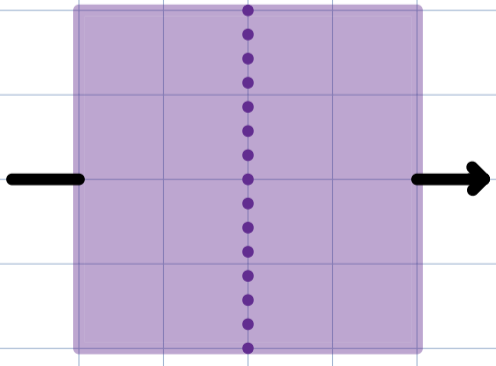
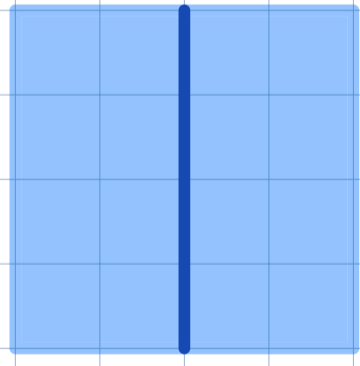
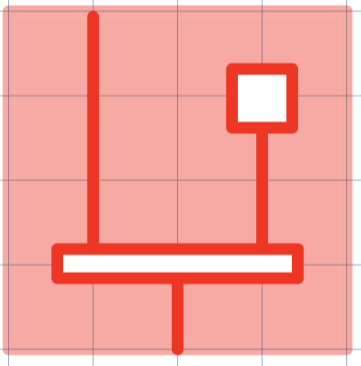
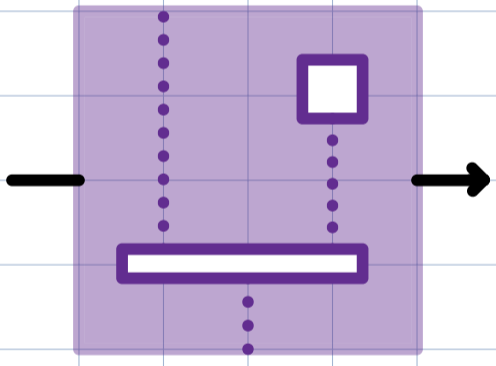
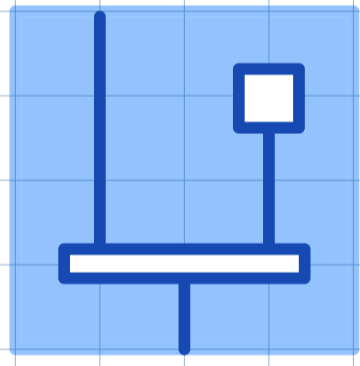
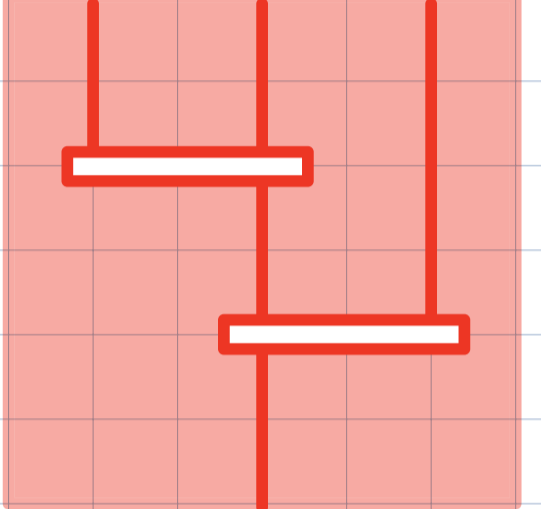
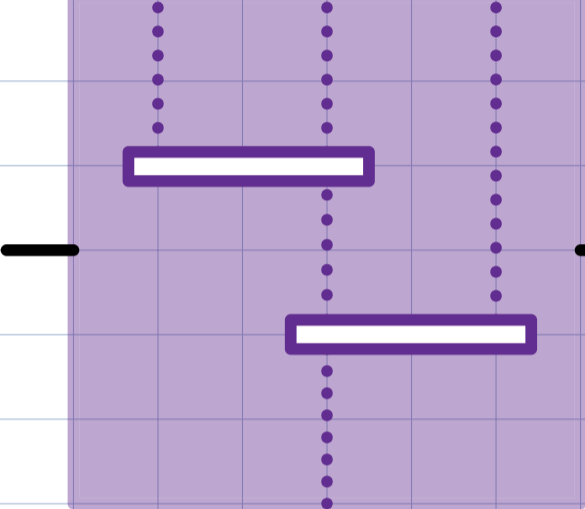
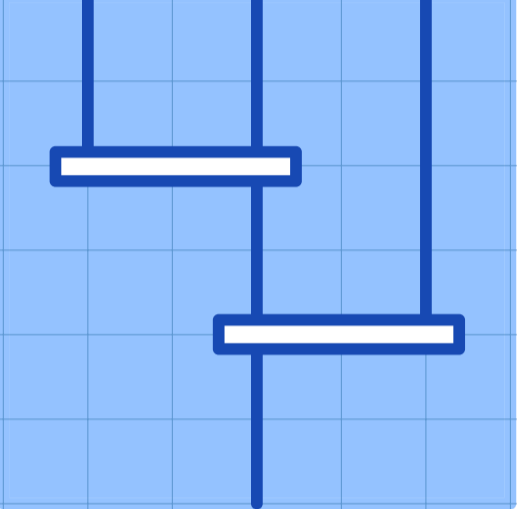
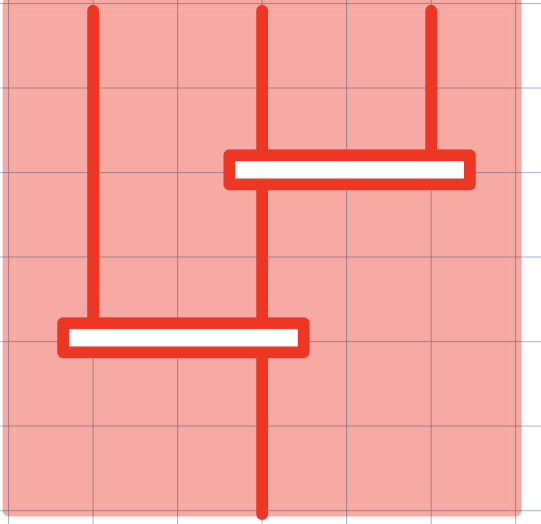
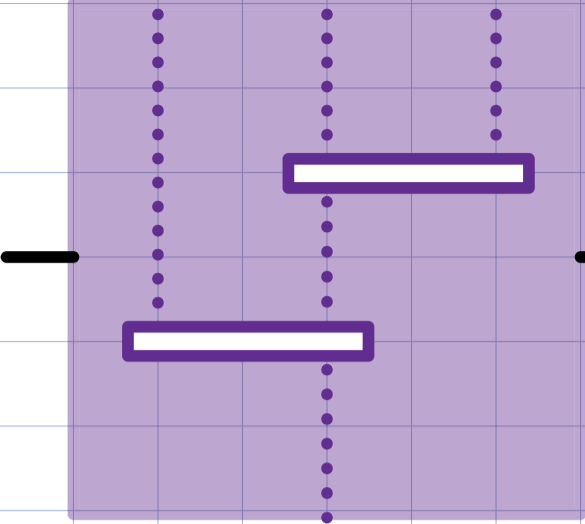
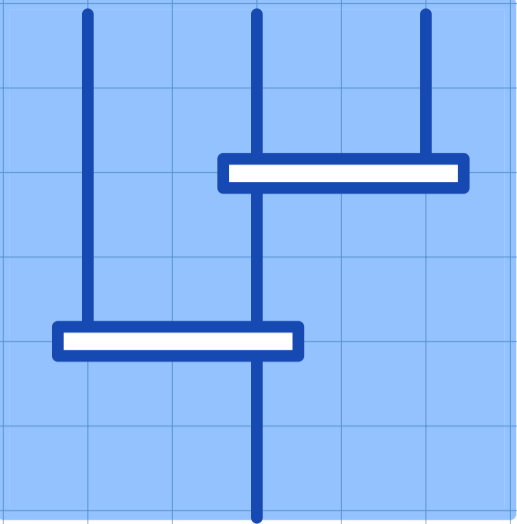
fibered trans
parallel composition



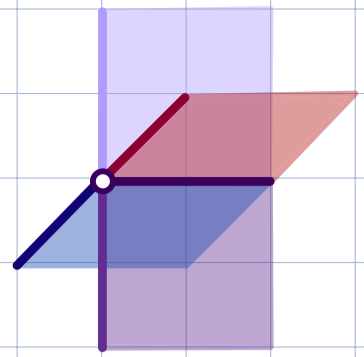
nullary introduction



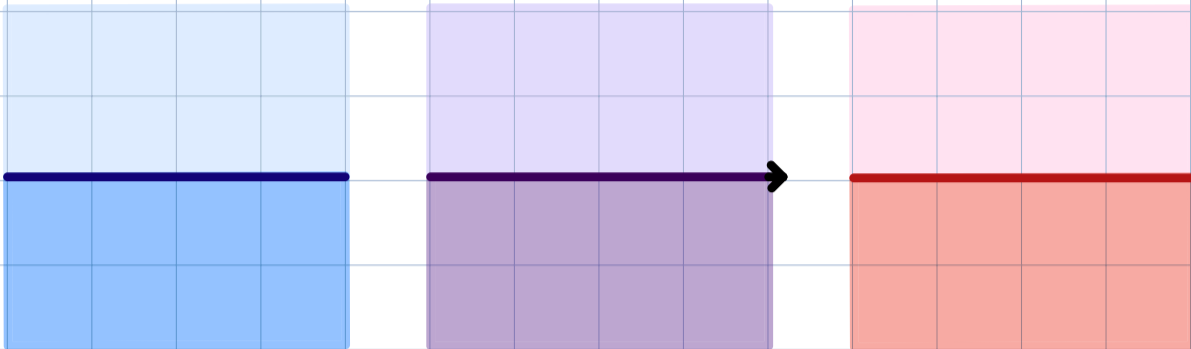
4



Term system (vertical transform)



2

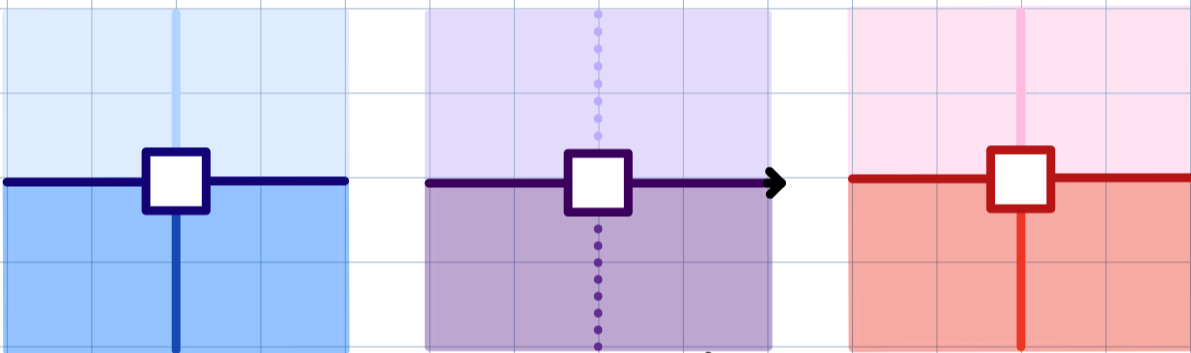


natural
transformation



maps heteroterms
to heteroterms

3

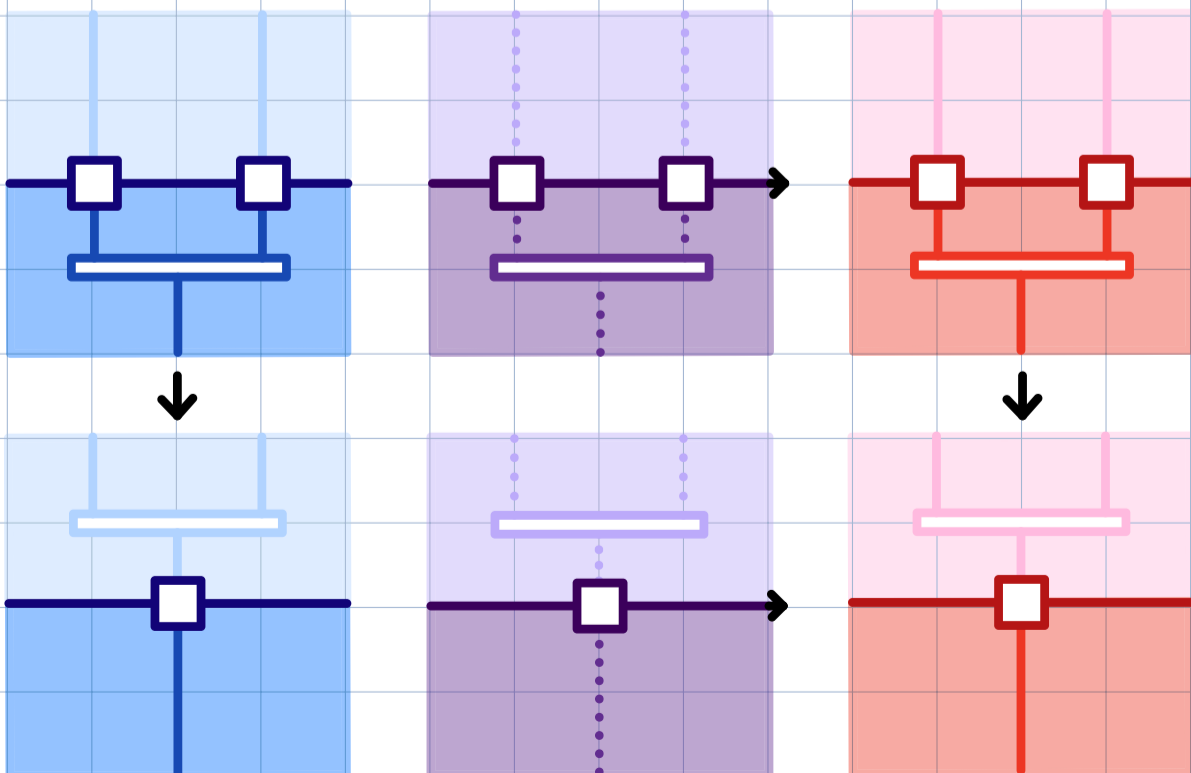


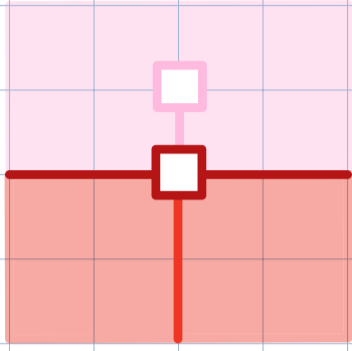
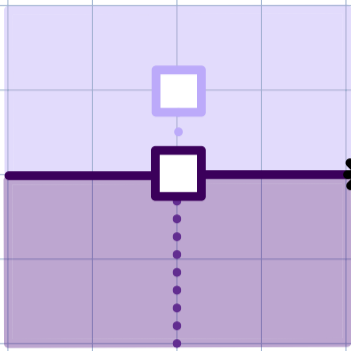
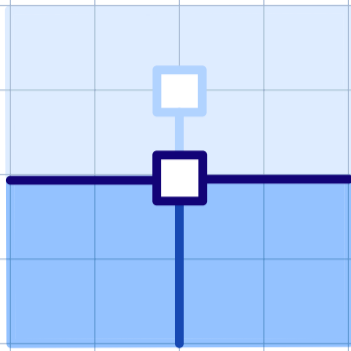
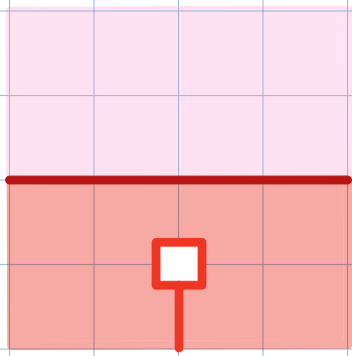
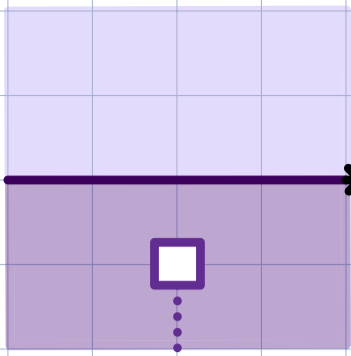
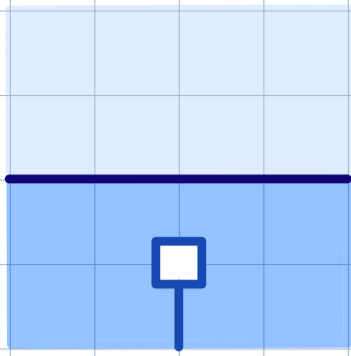
fibered
transformation



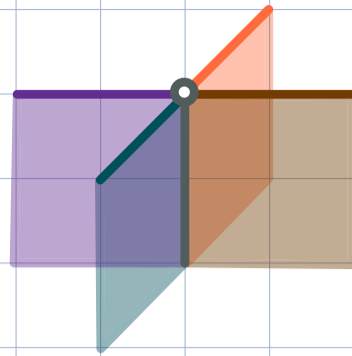
maps hetero-ifs
to hetero-ifs

4

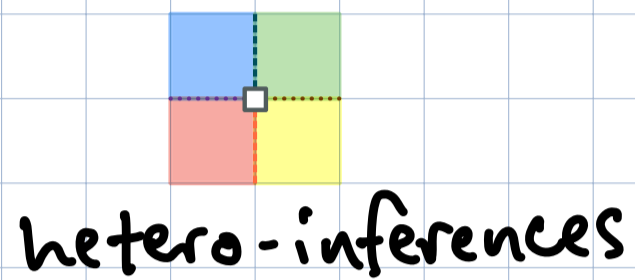
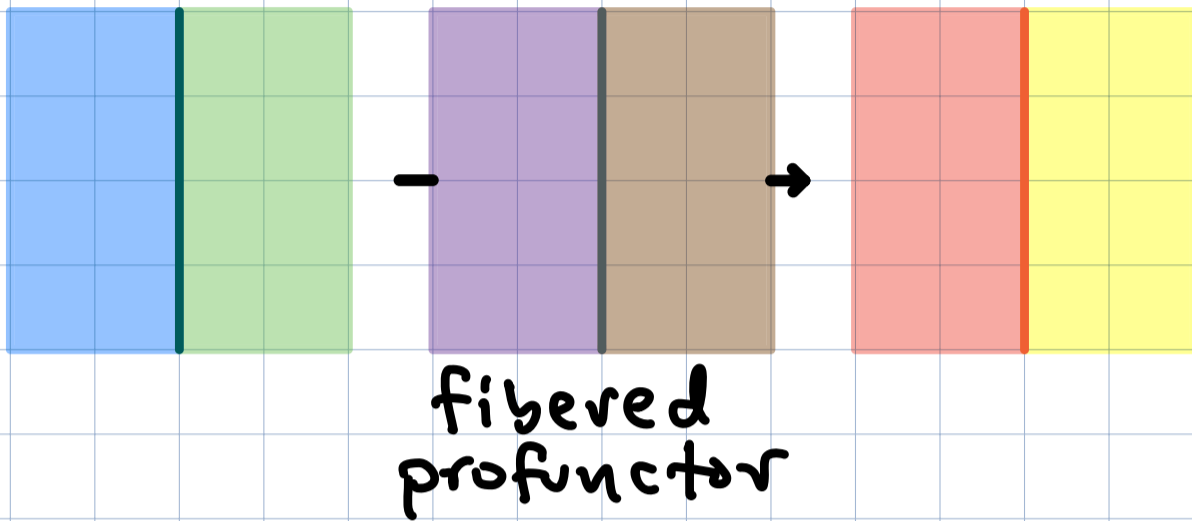




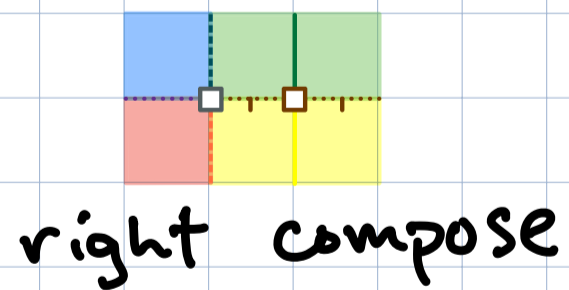
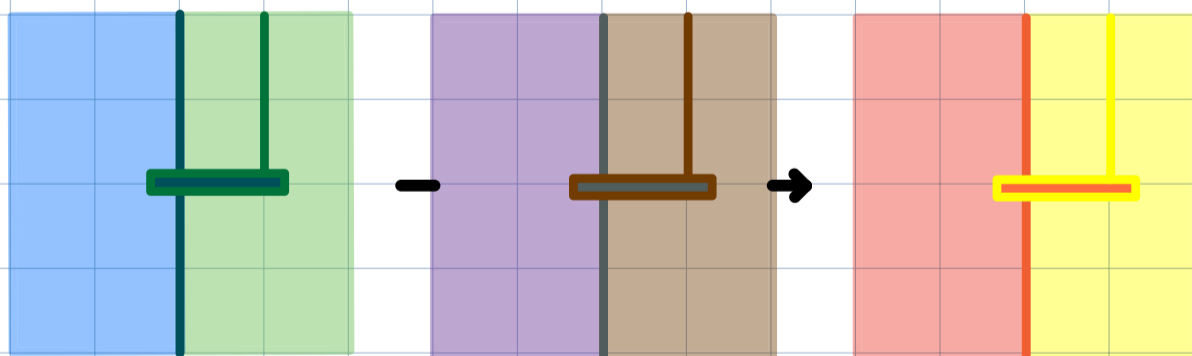
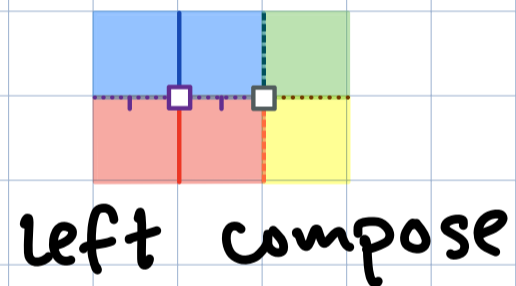
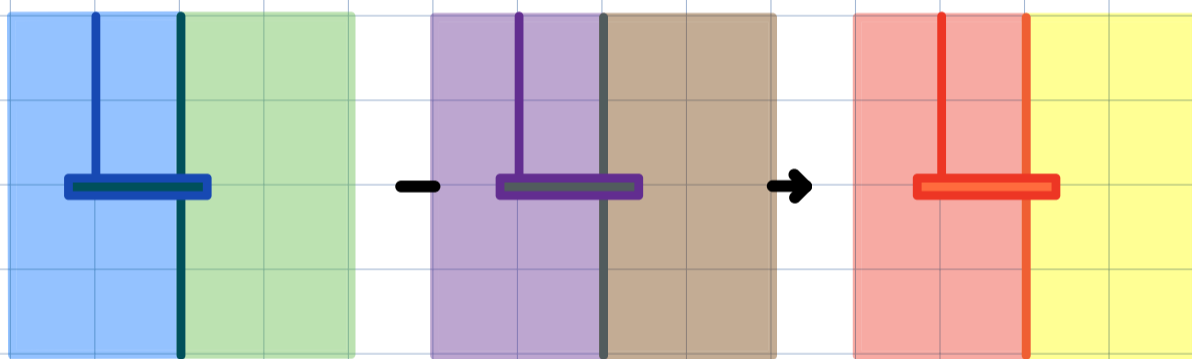
Meta-inference ["Double module"]



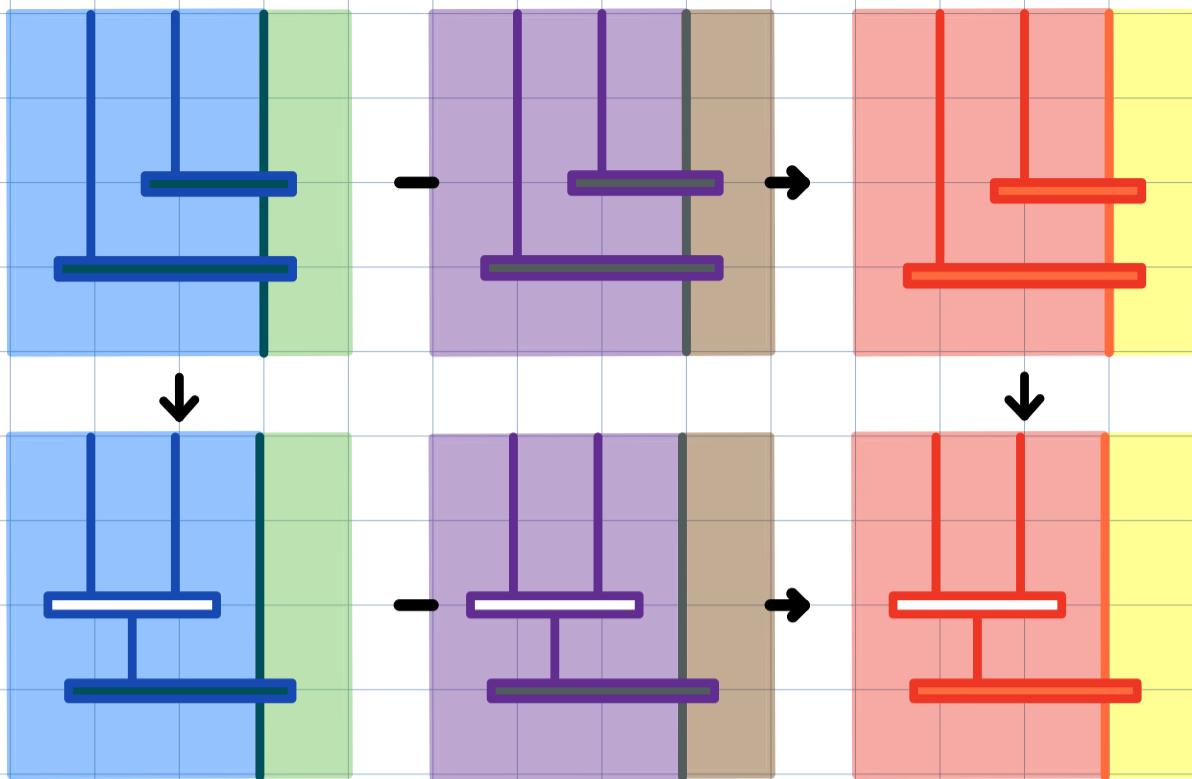
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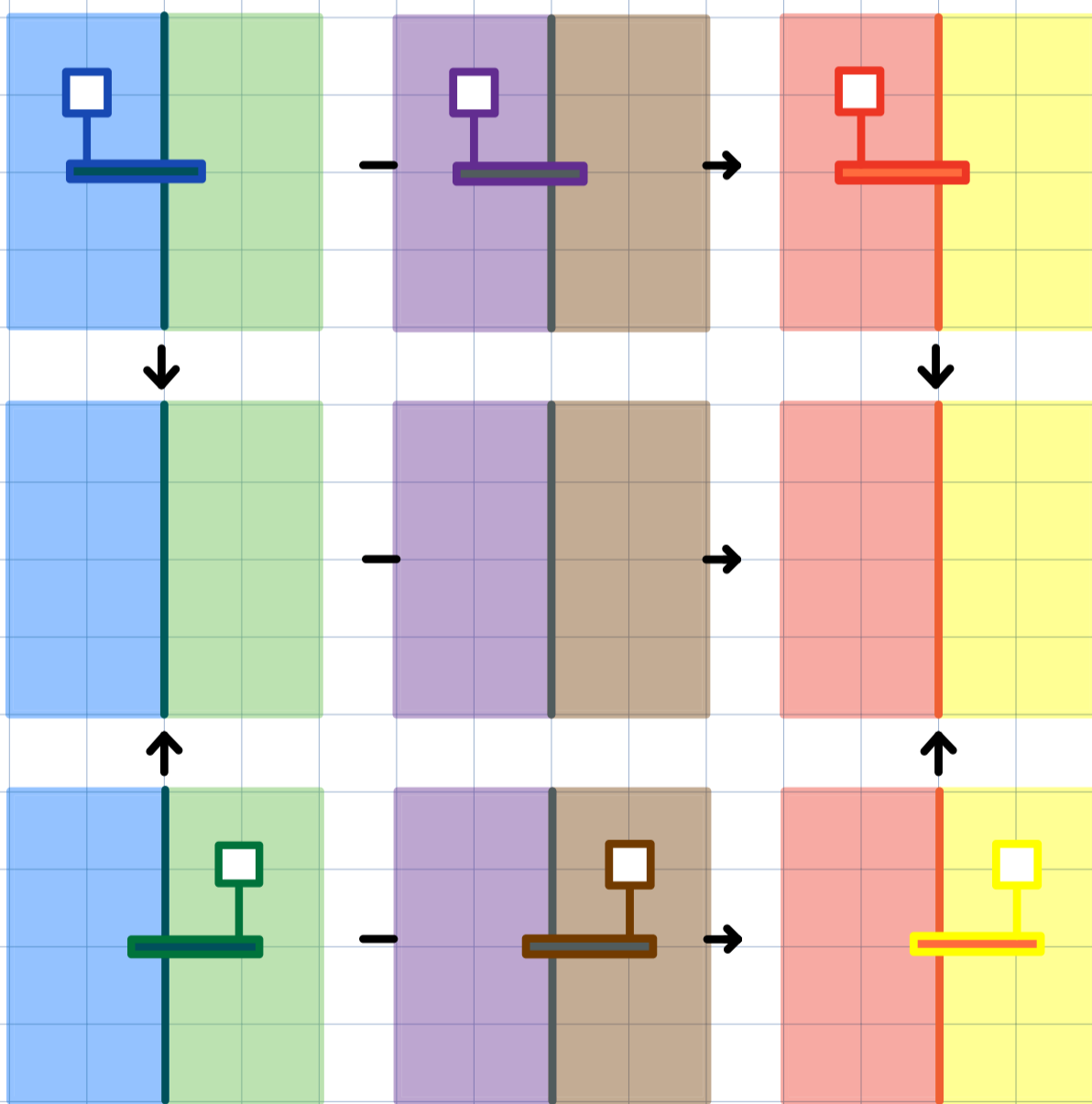
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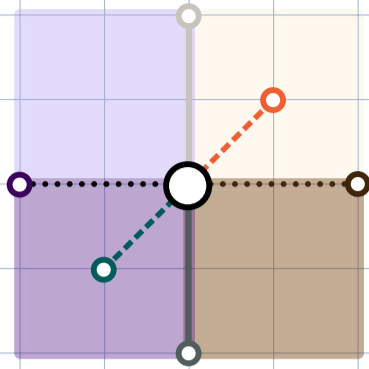
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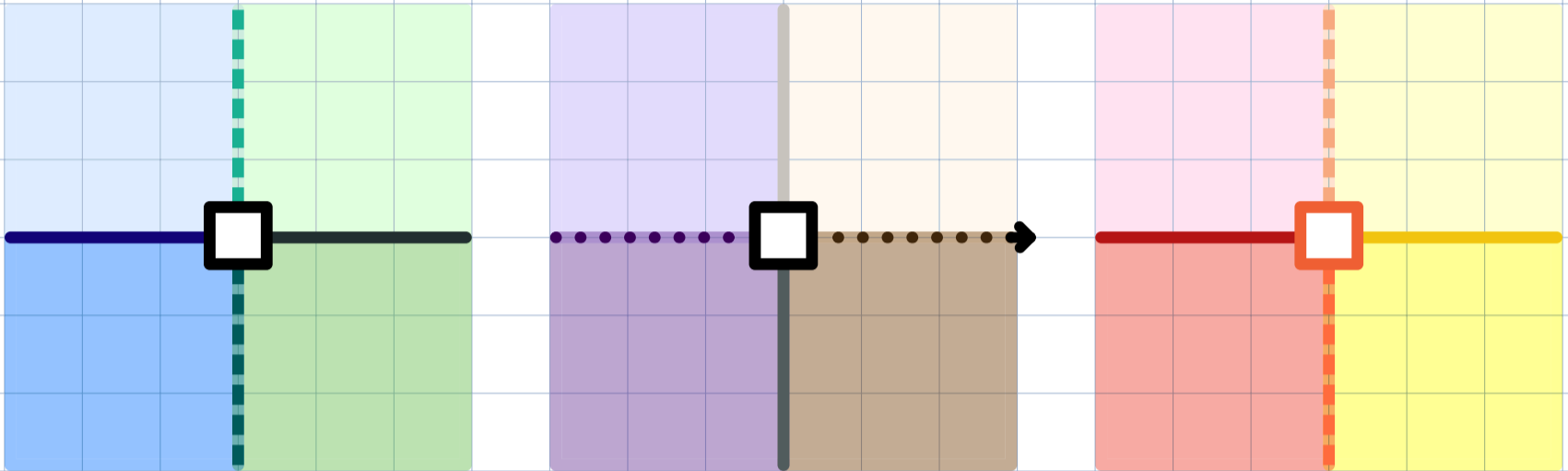
& same for



Inference system (Modification)

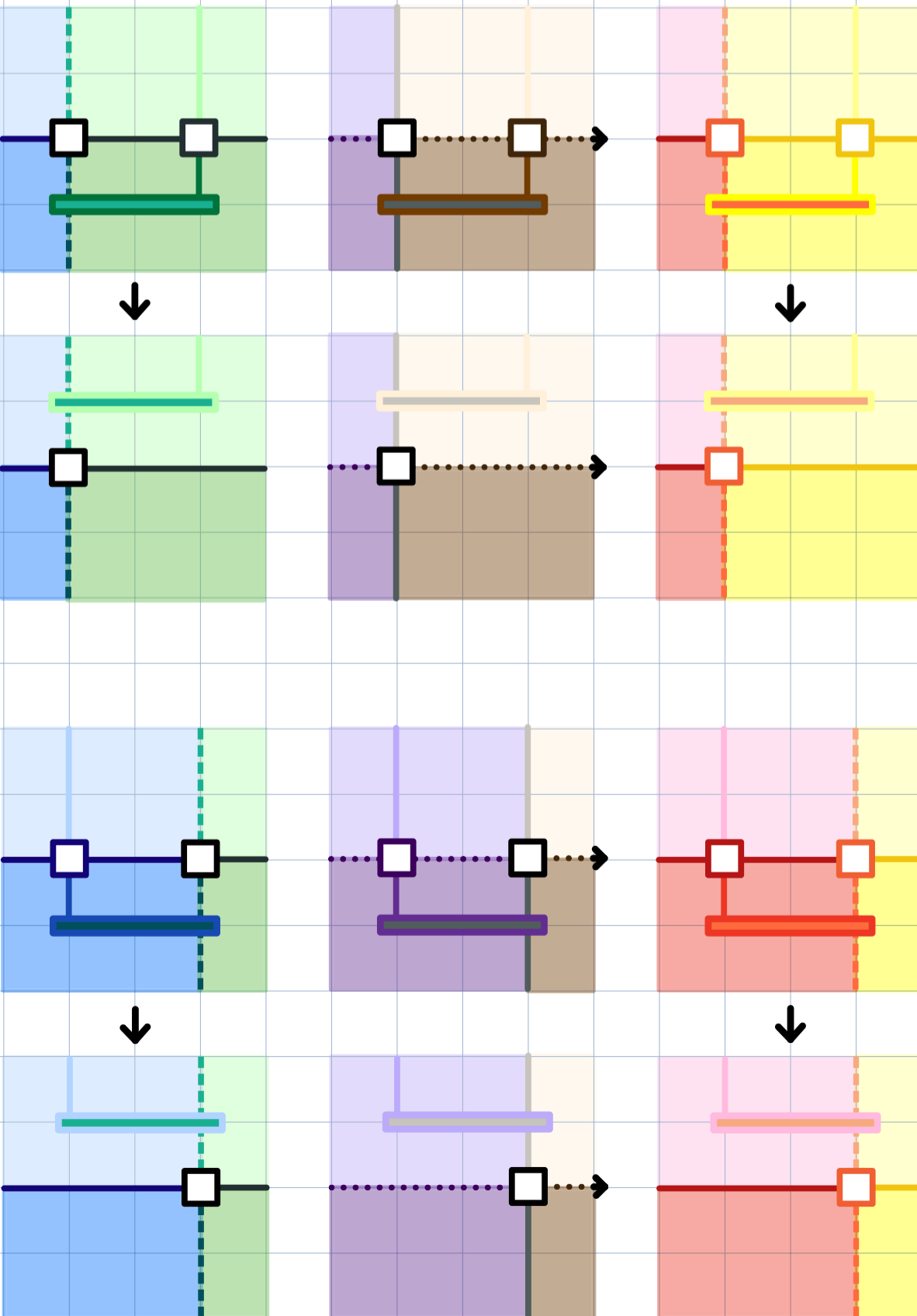


3



fibered transformation

4



maps
hetero-infs
to
hetero-infs