

Lesson 16 Problem 1 hint:  
How to get the algebraic expression  
for a similar problem.

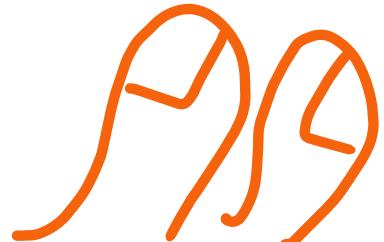
# Example 1

Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

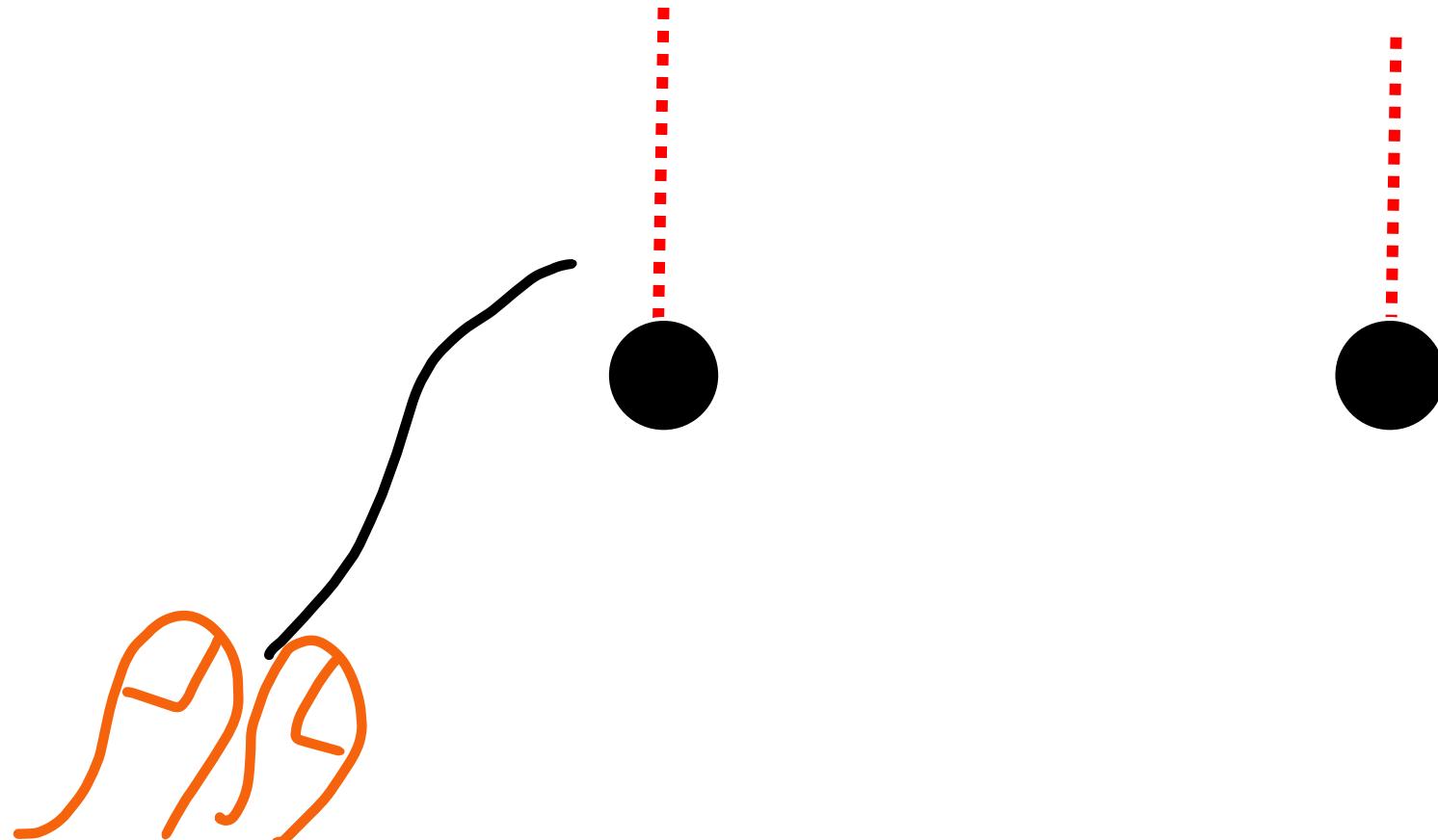


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

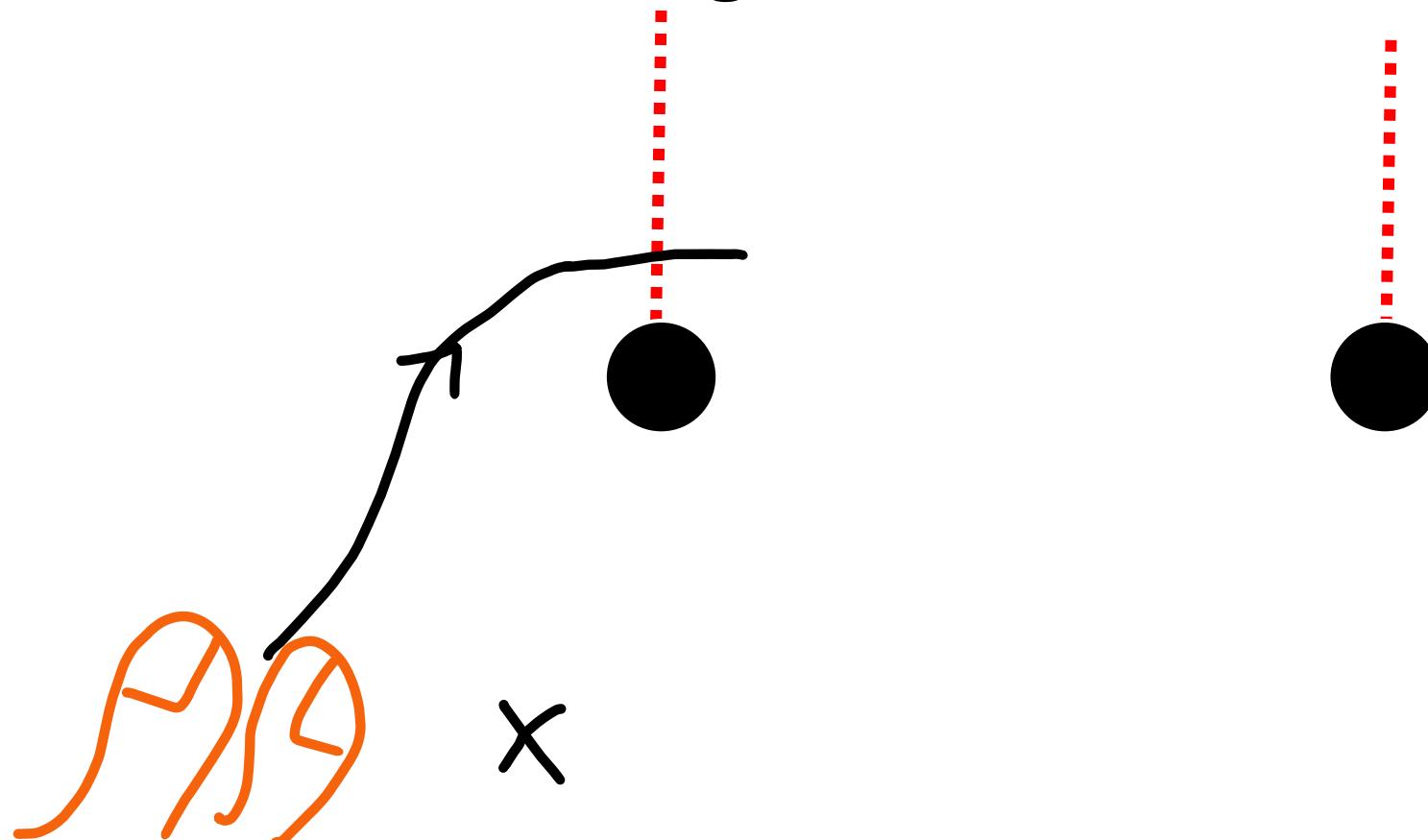


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

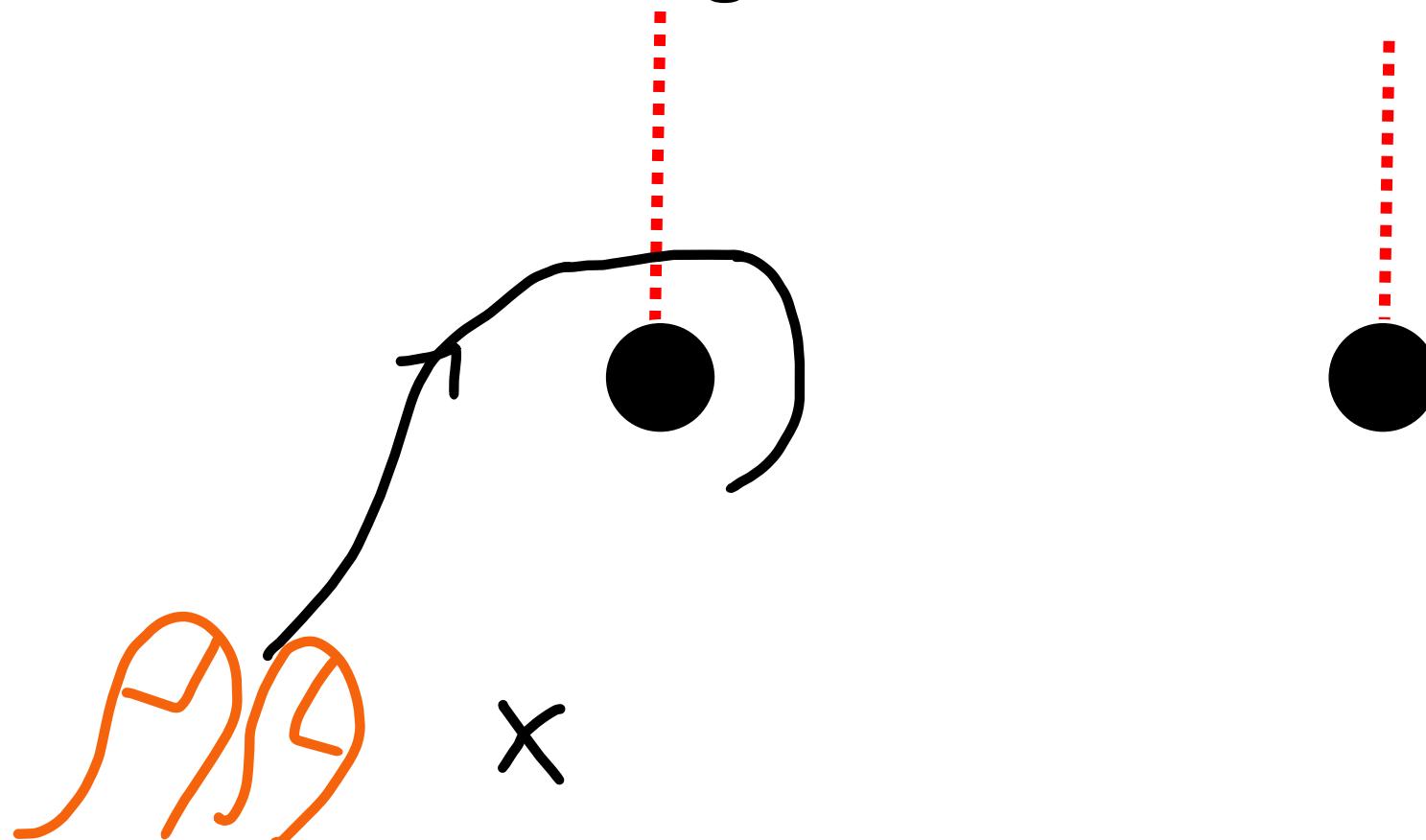


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

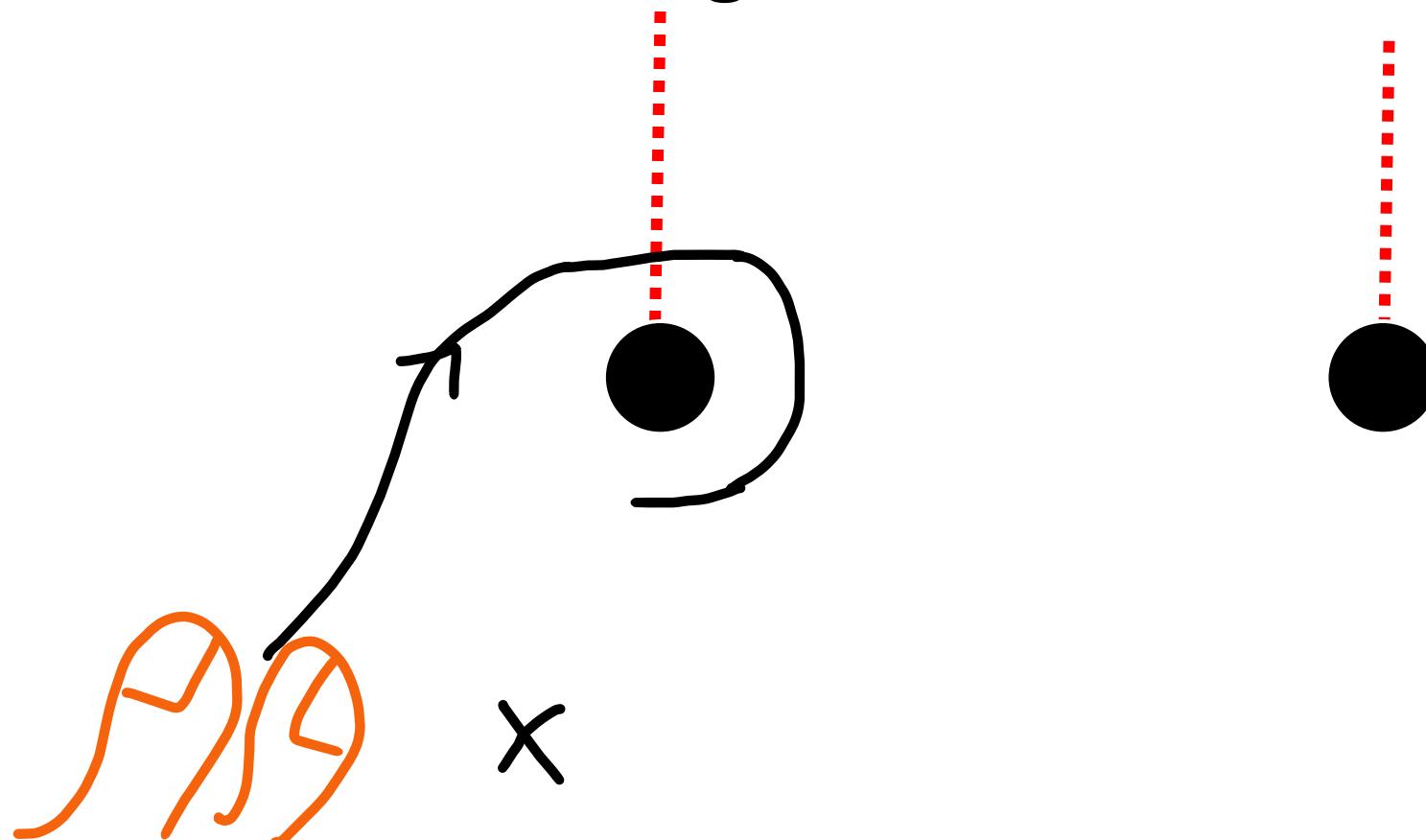


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

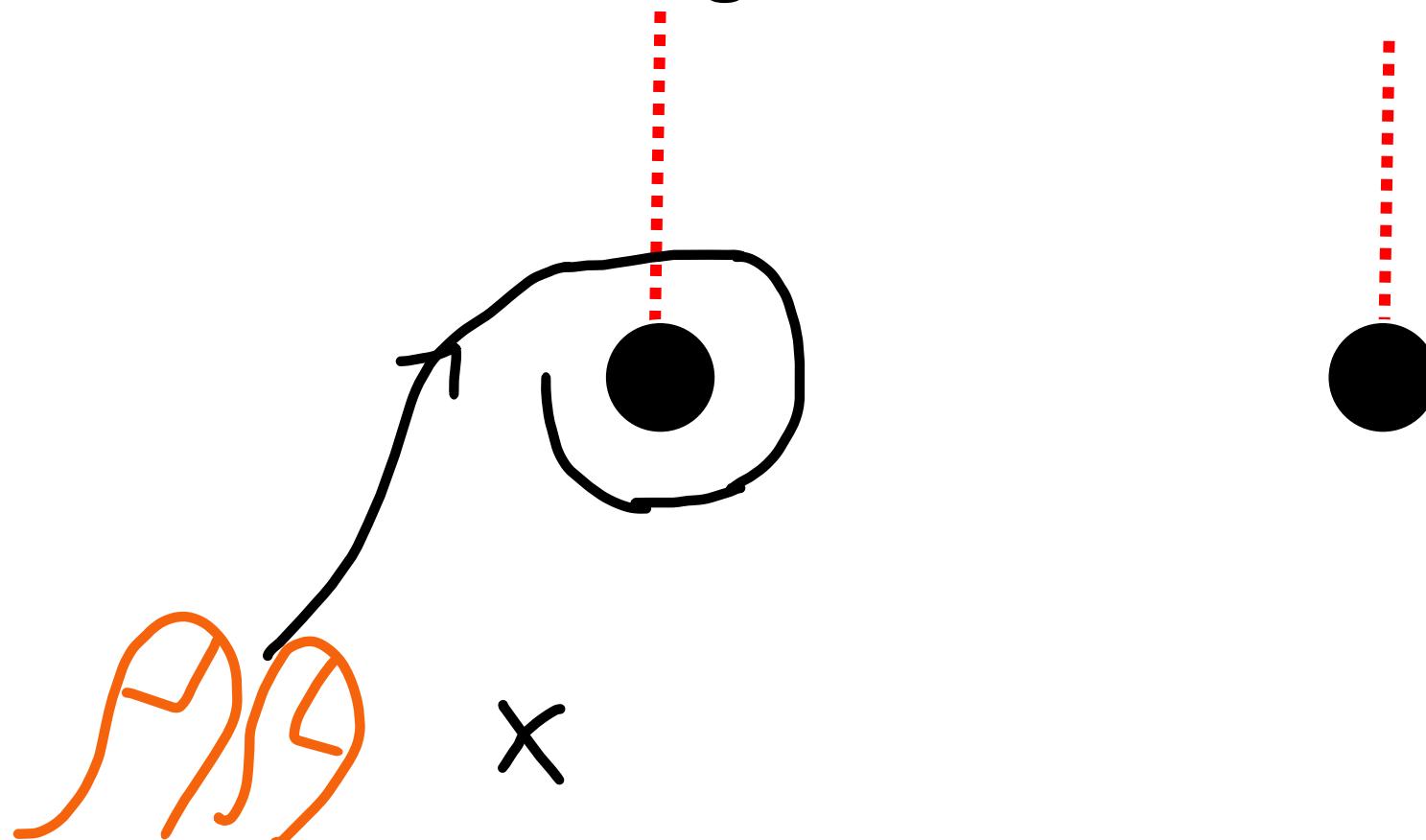


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

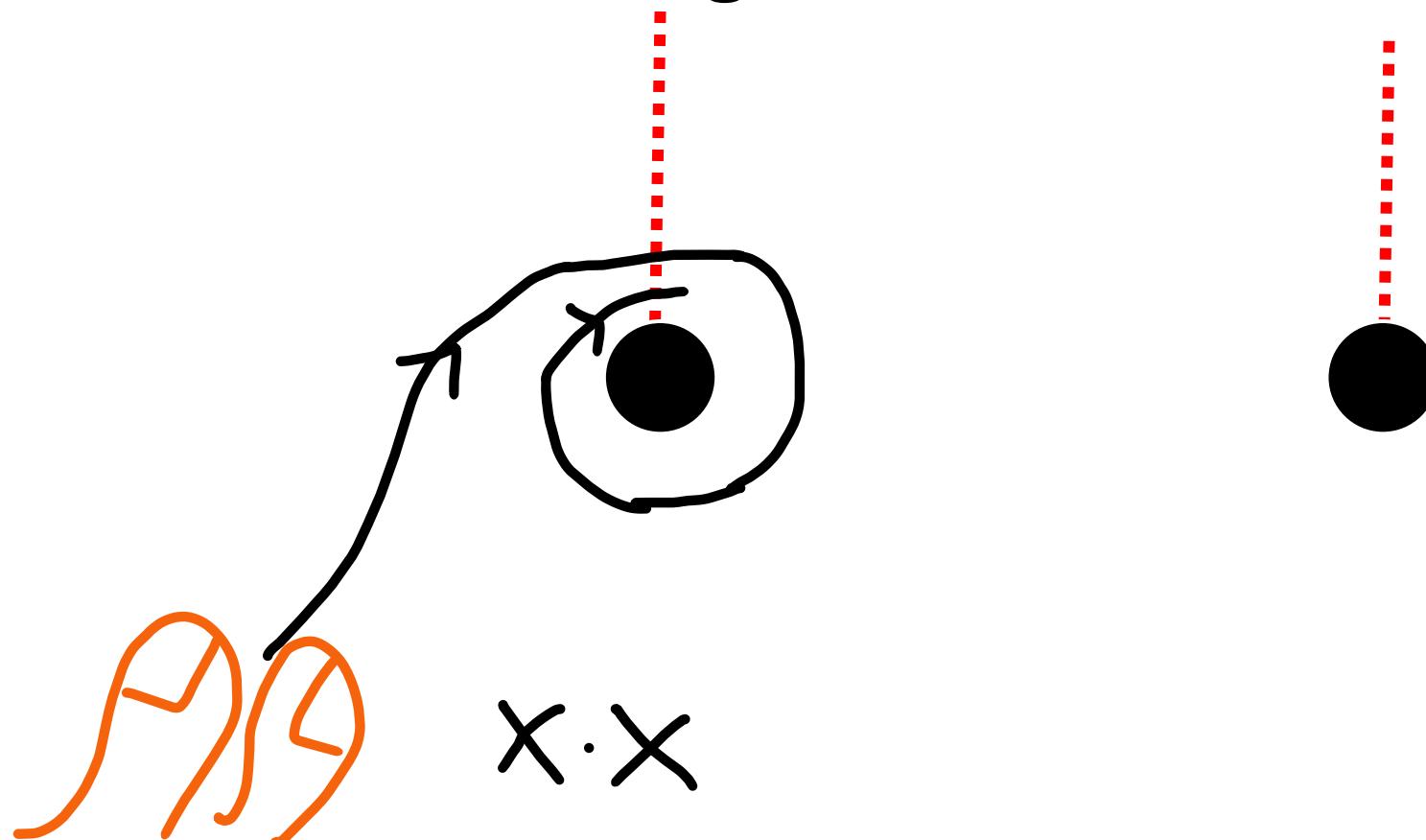


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

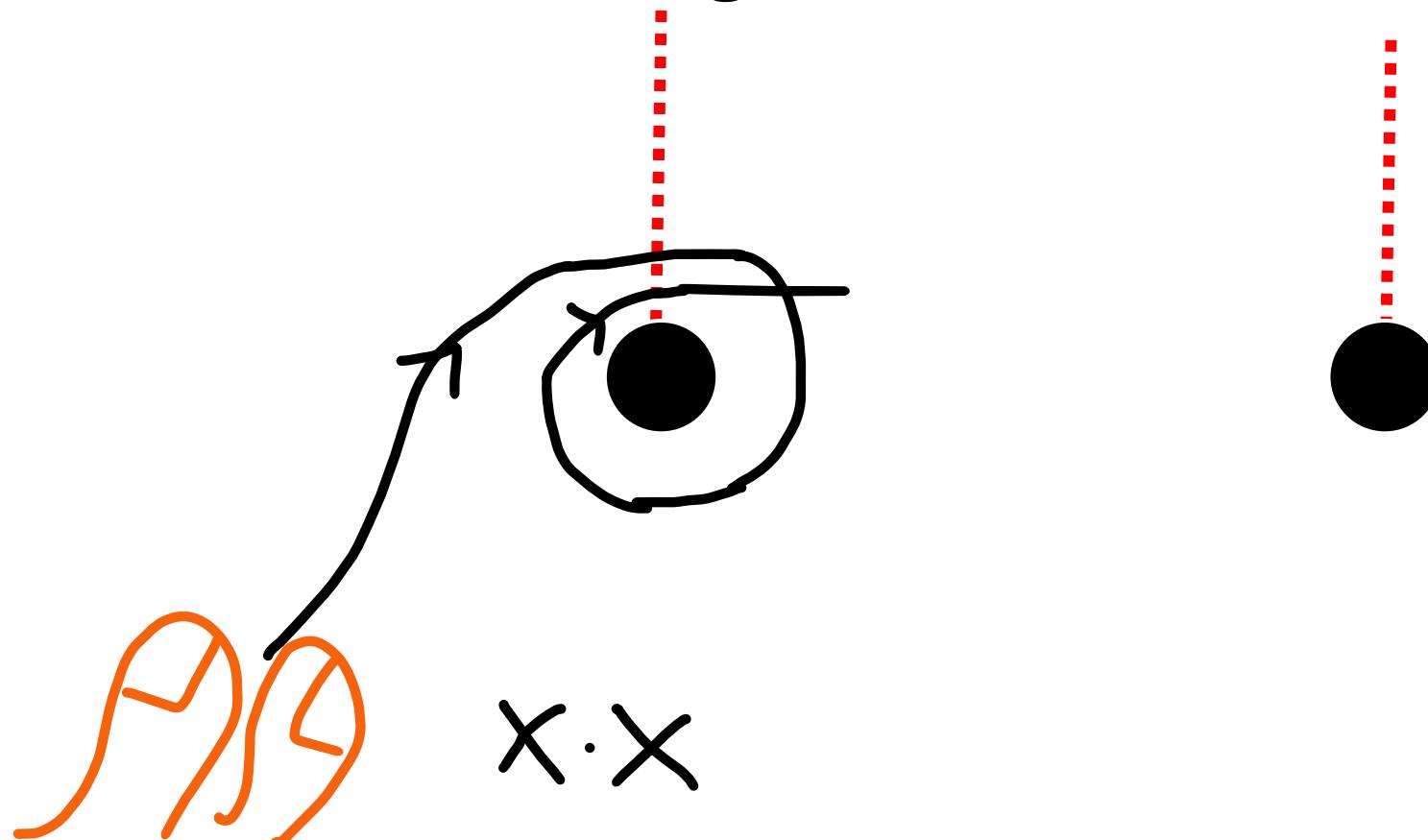


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

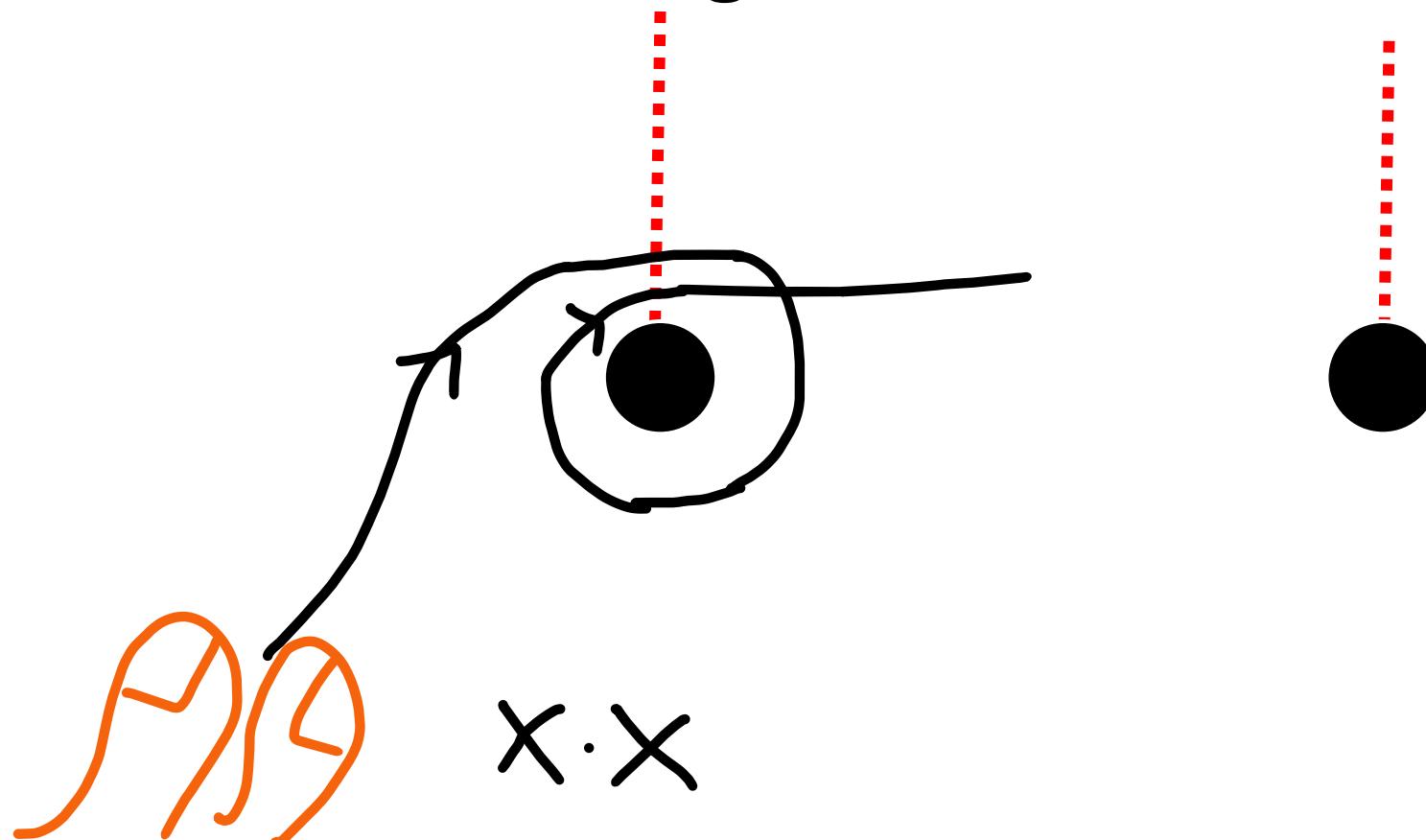


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

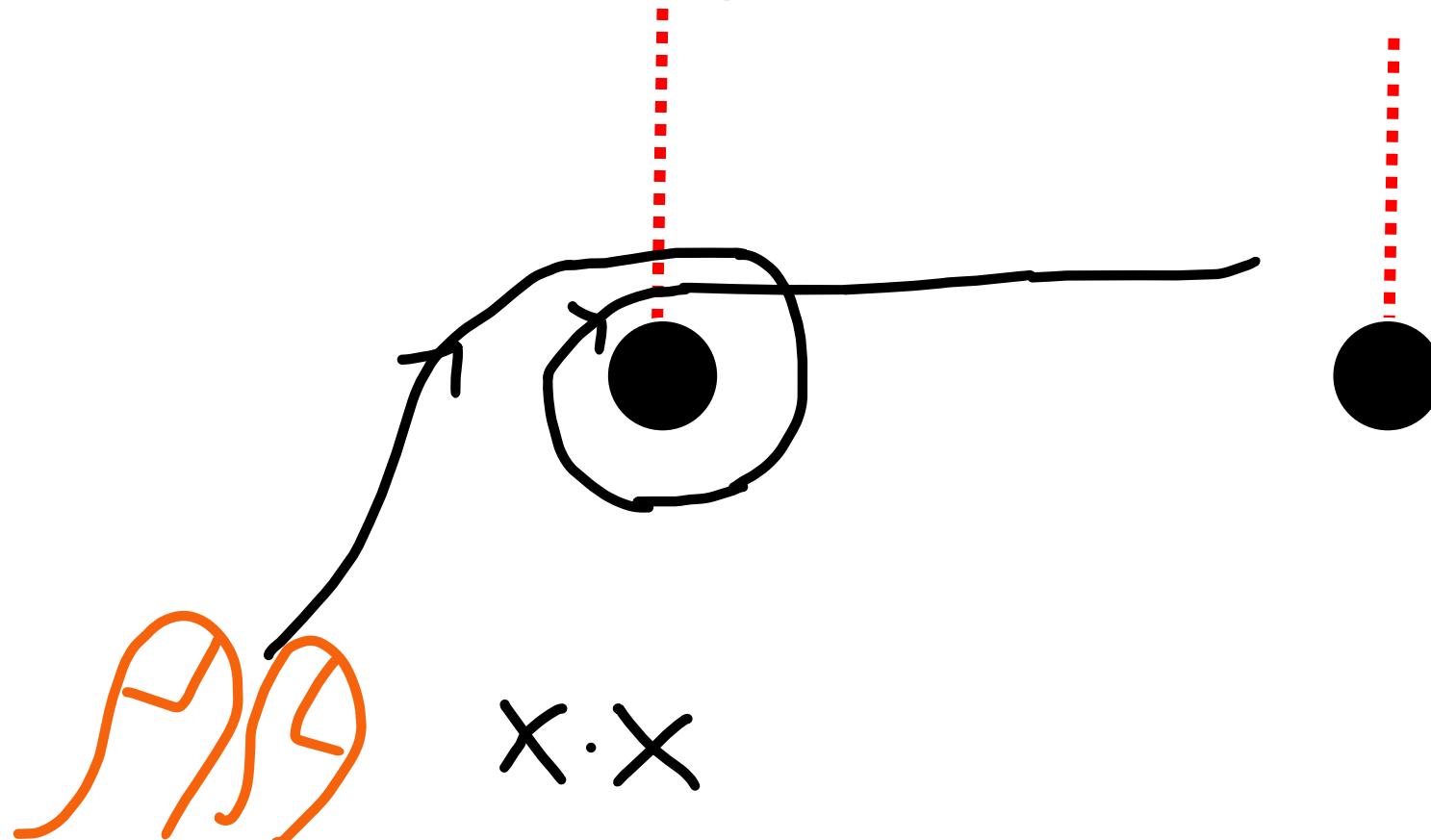


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

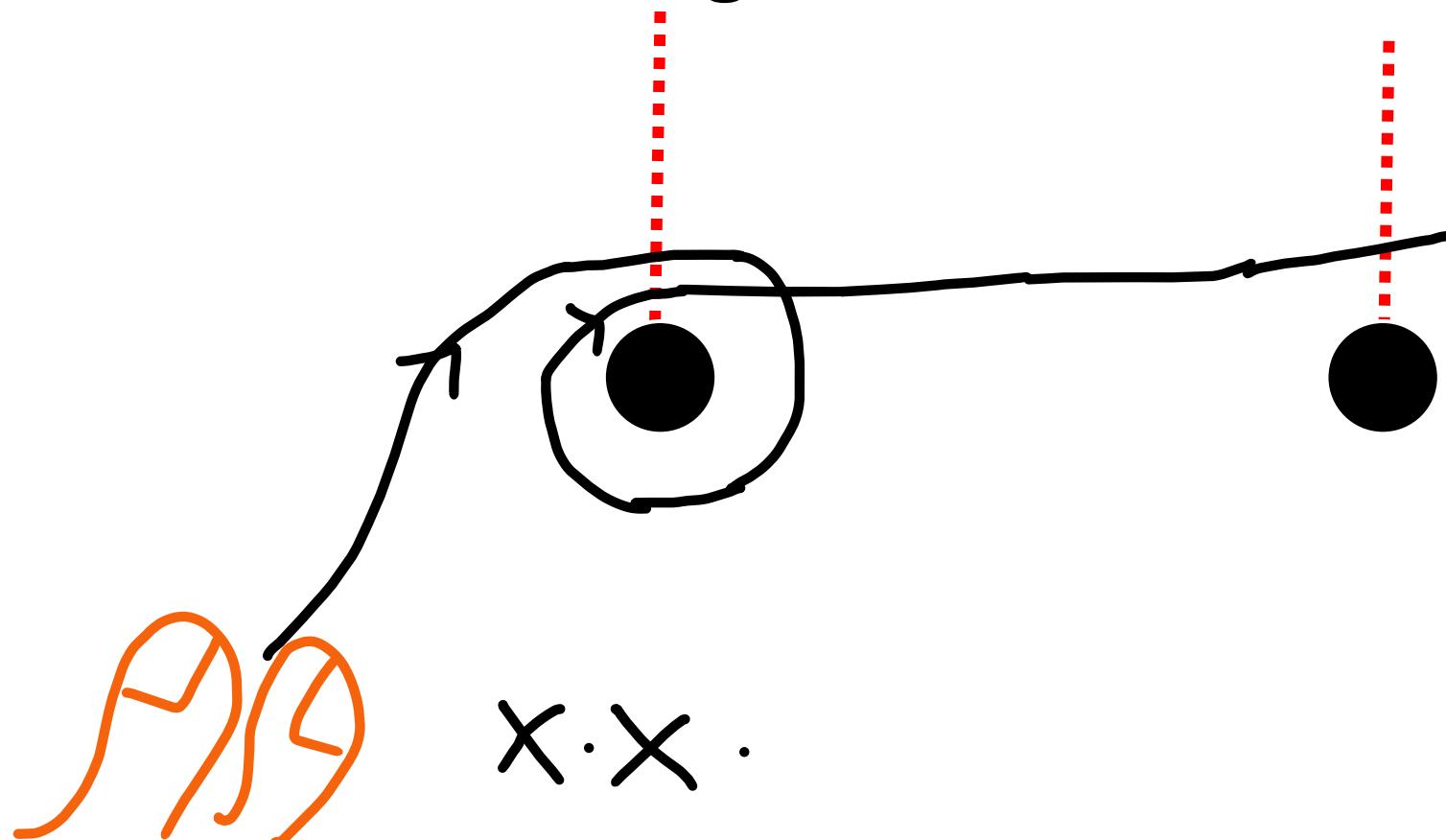


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

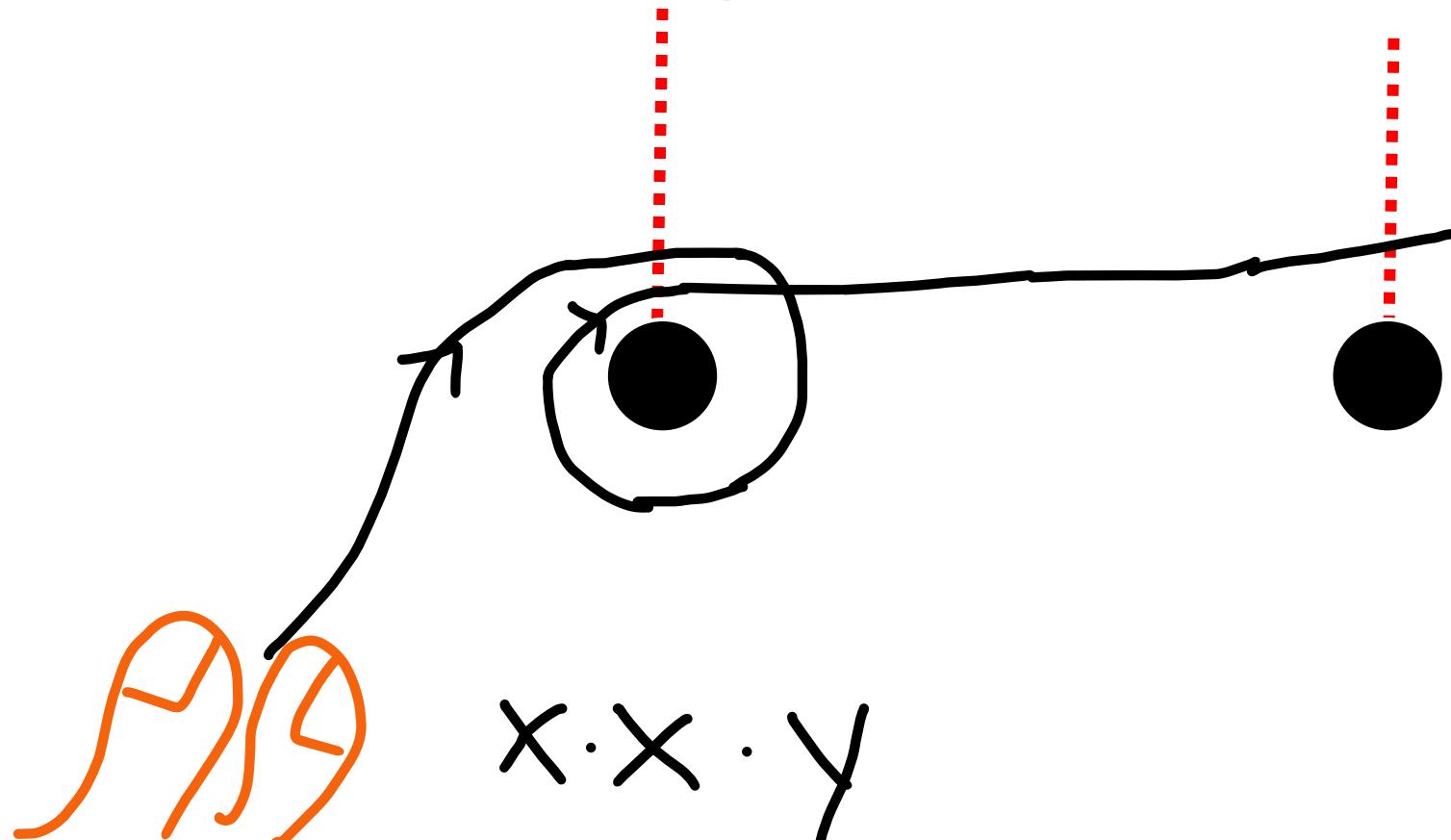


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

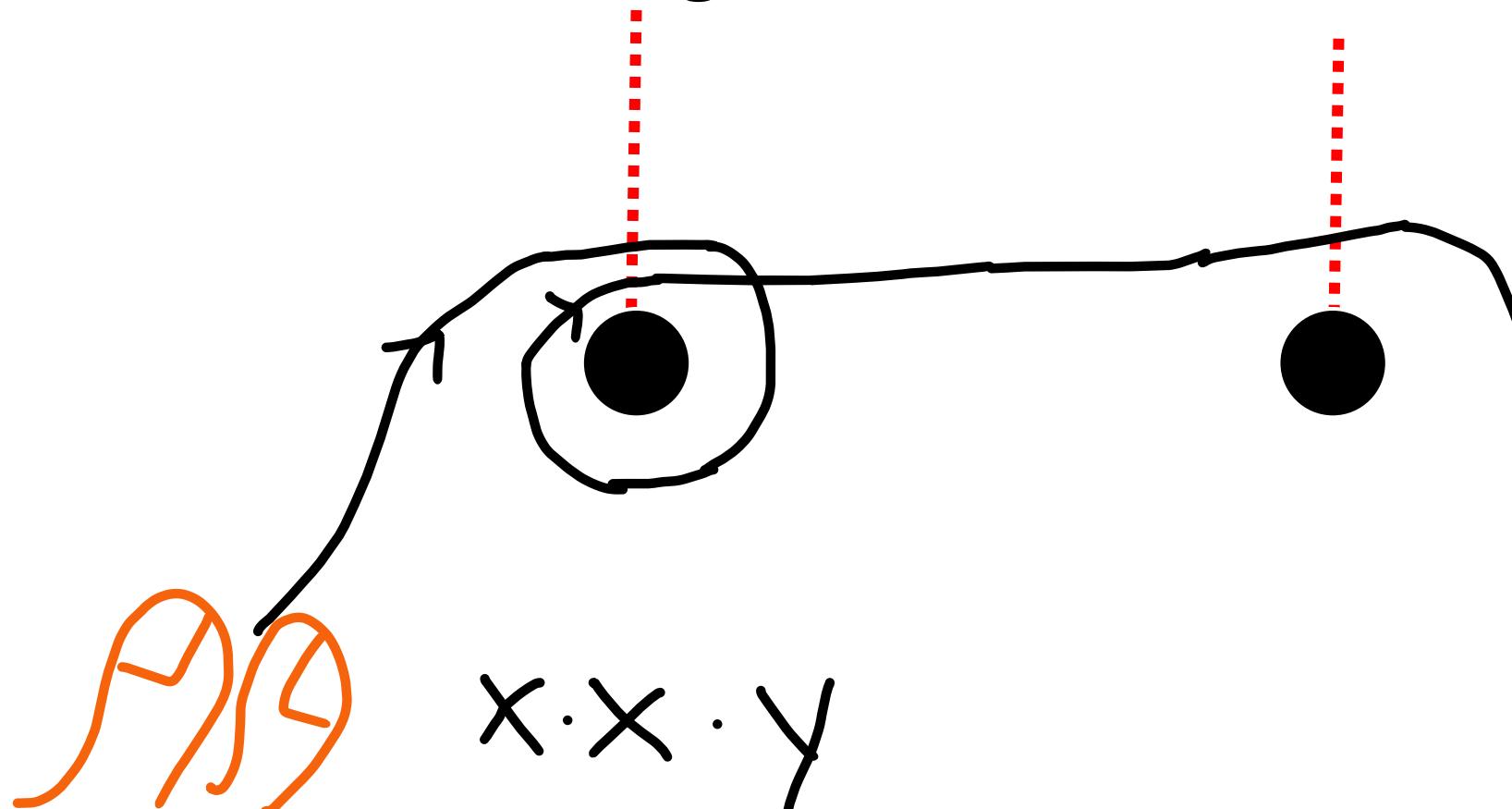


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

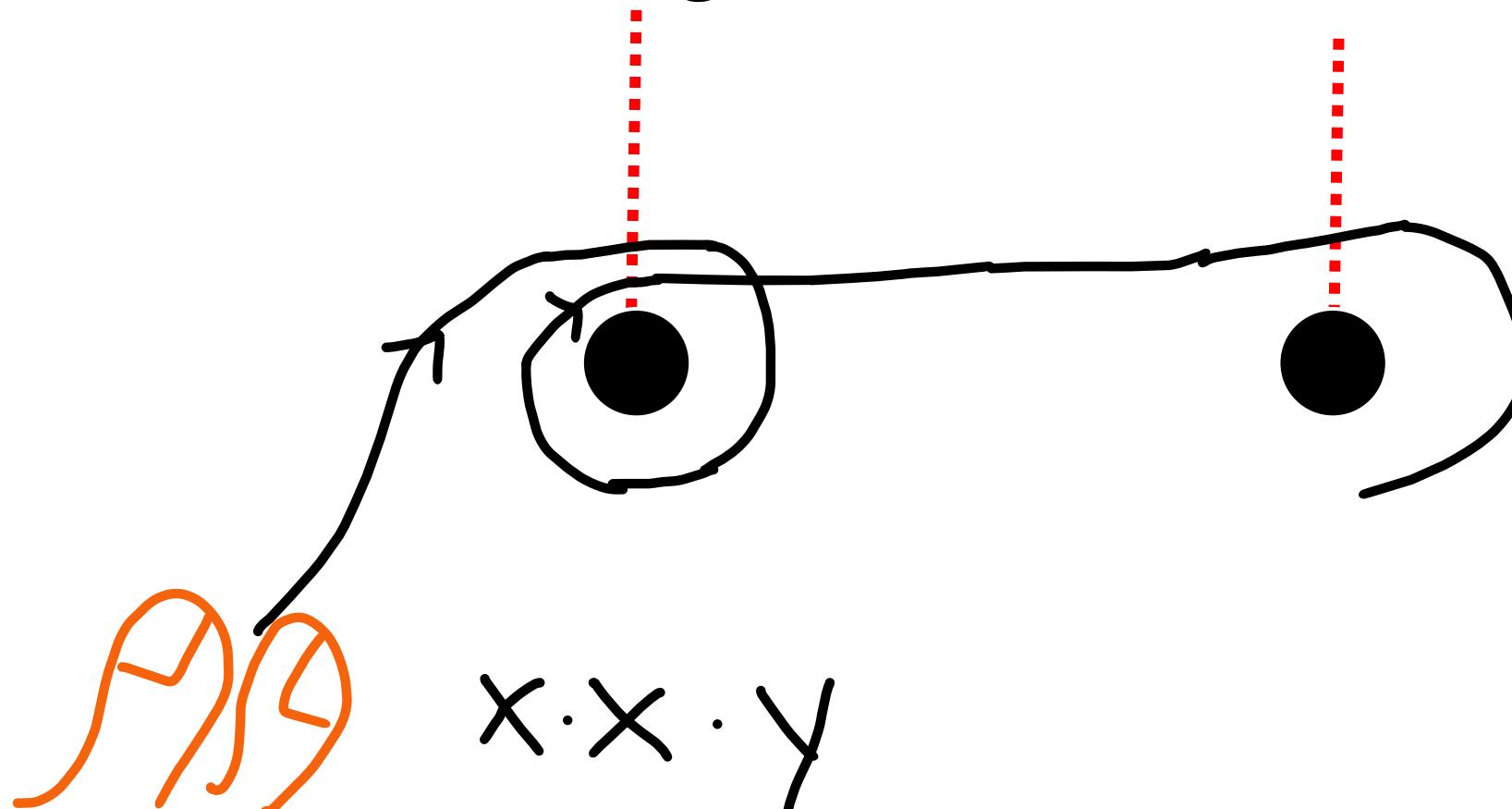


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

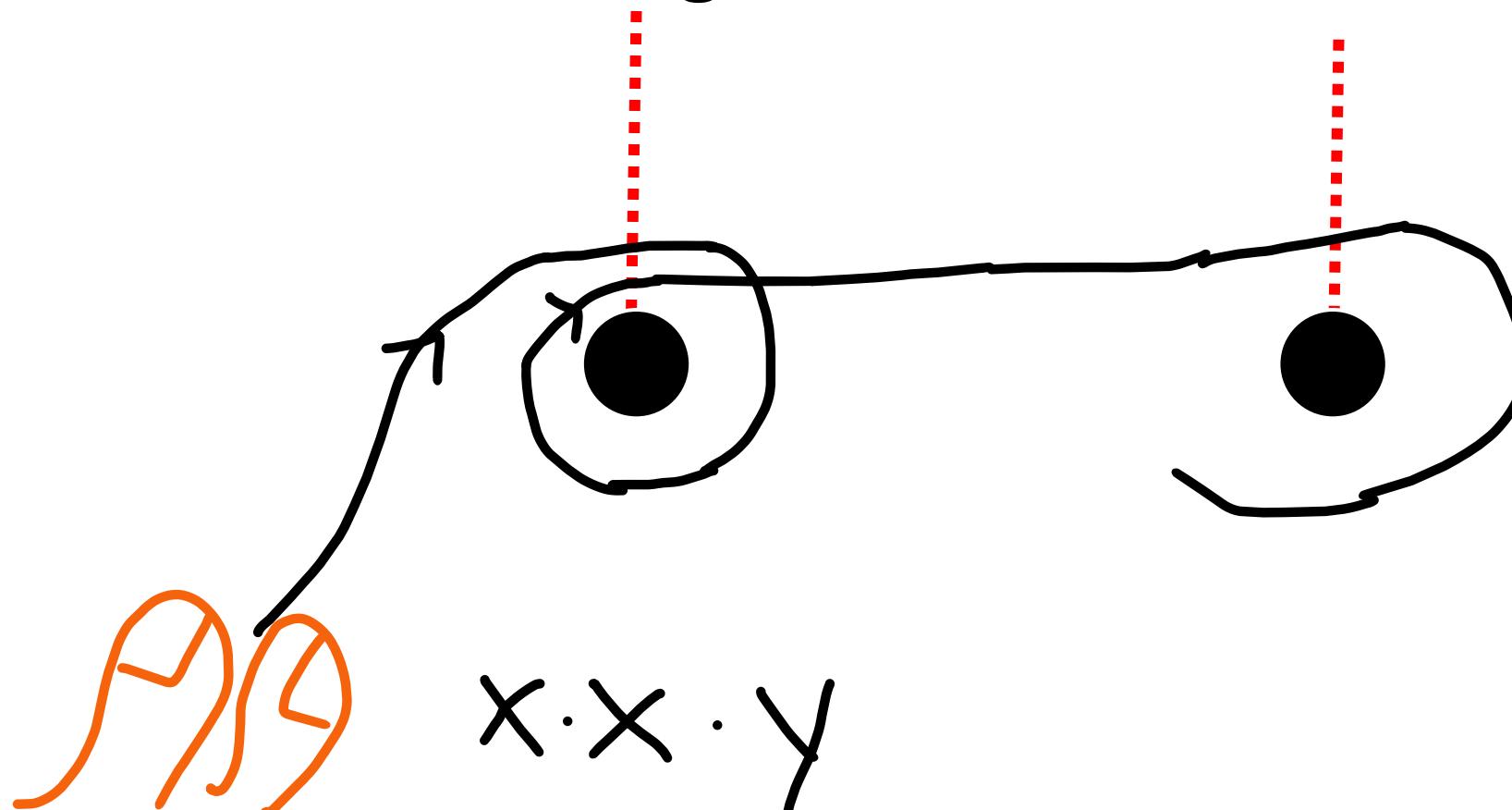


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

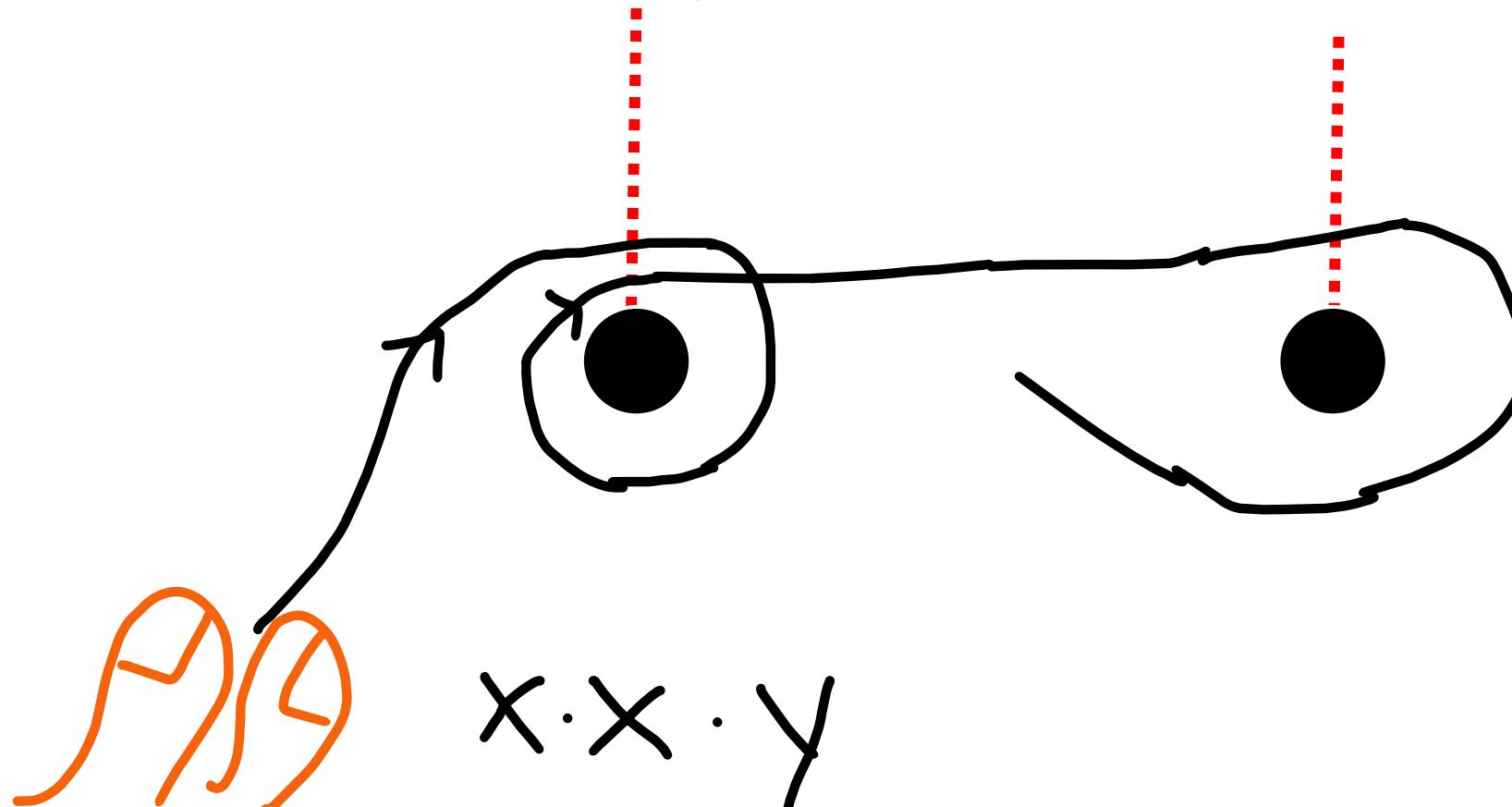


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

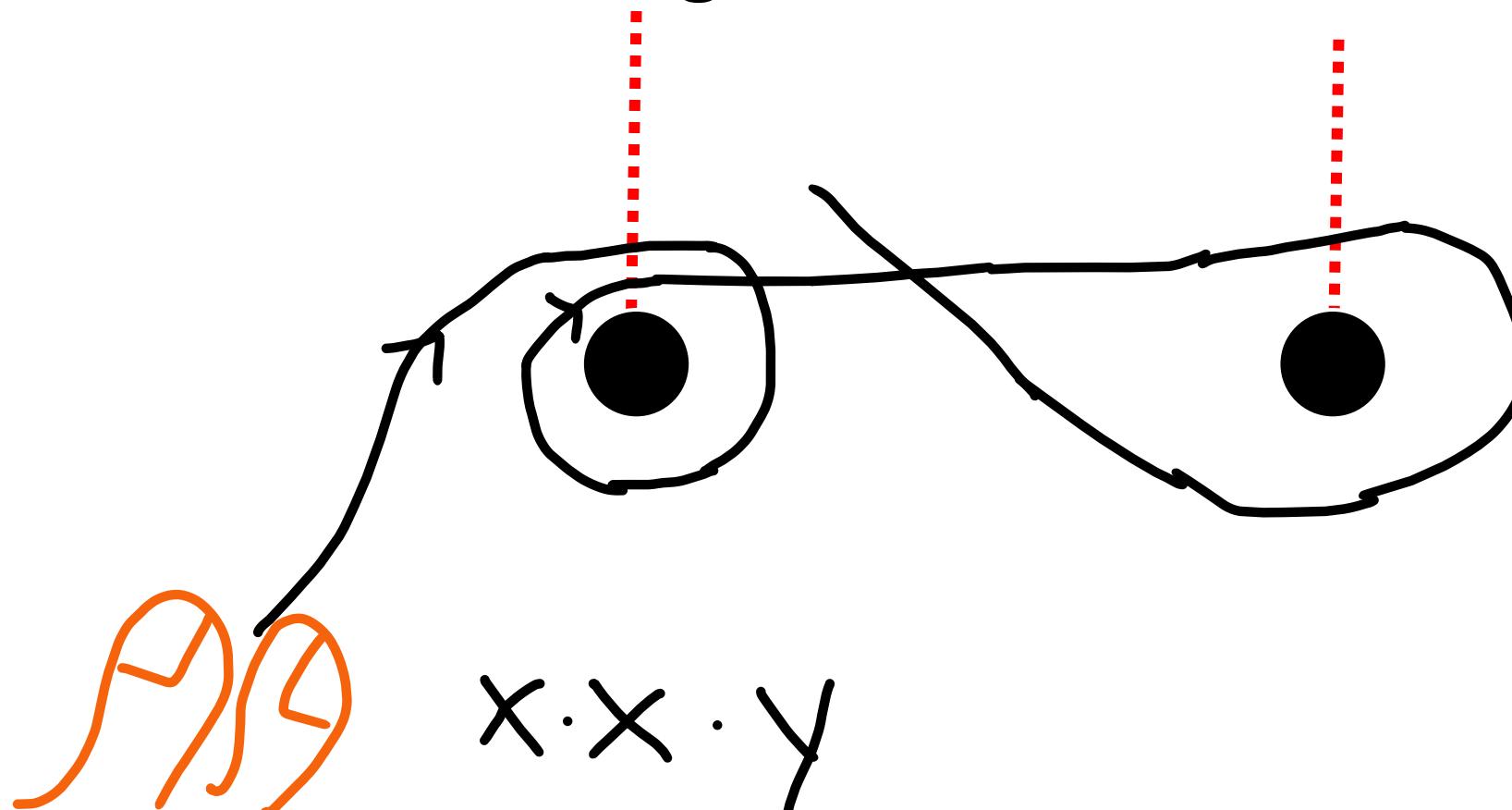


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

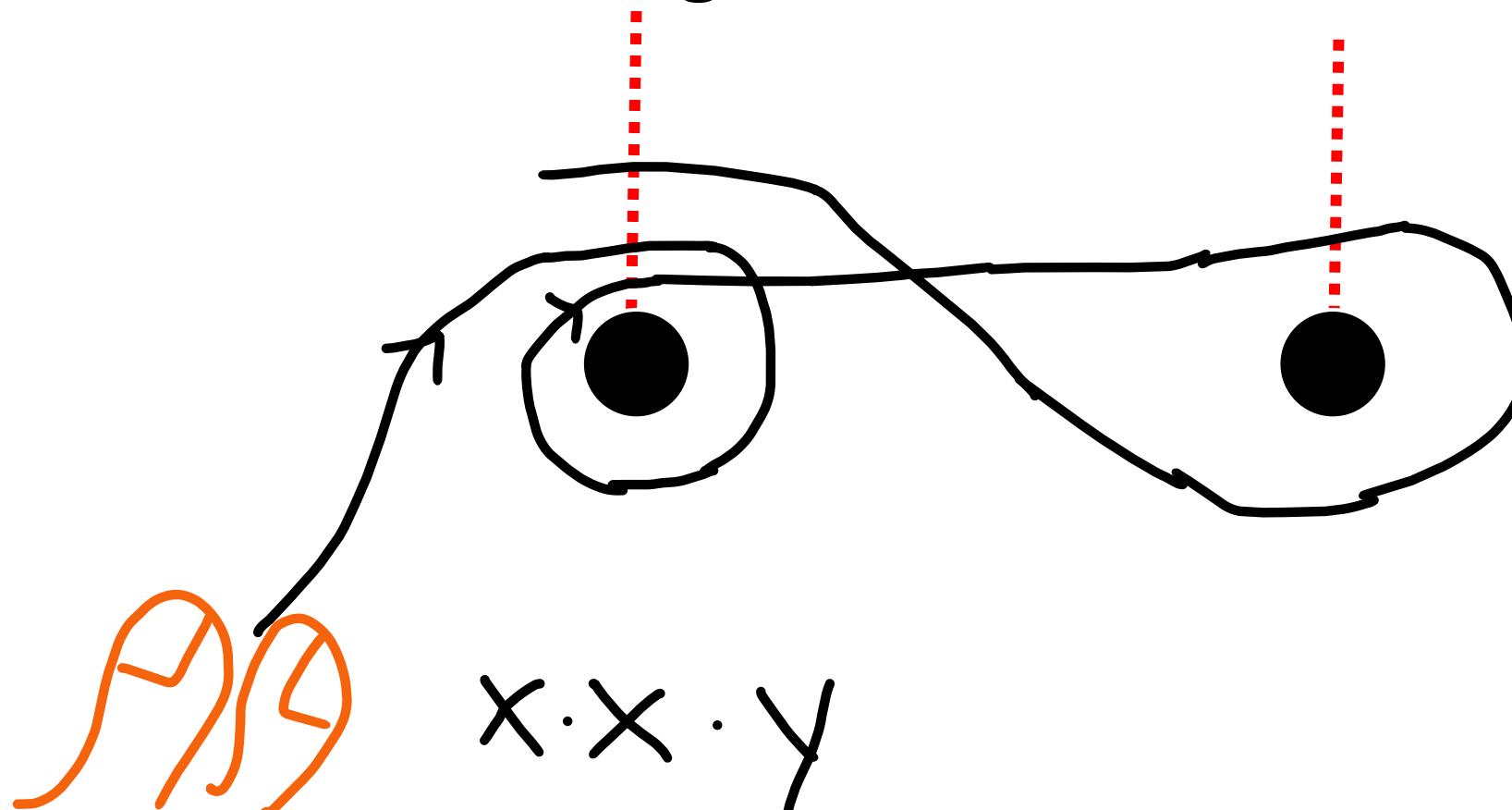


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

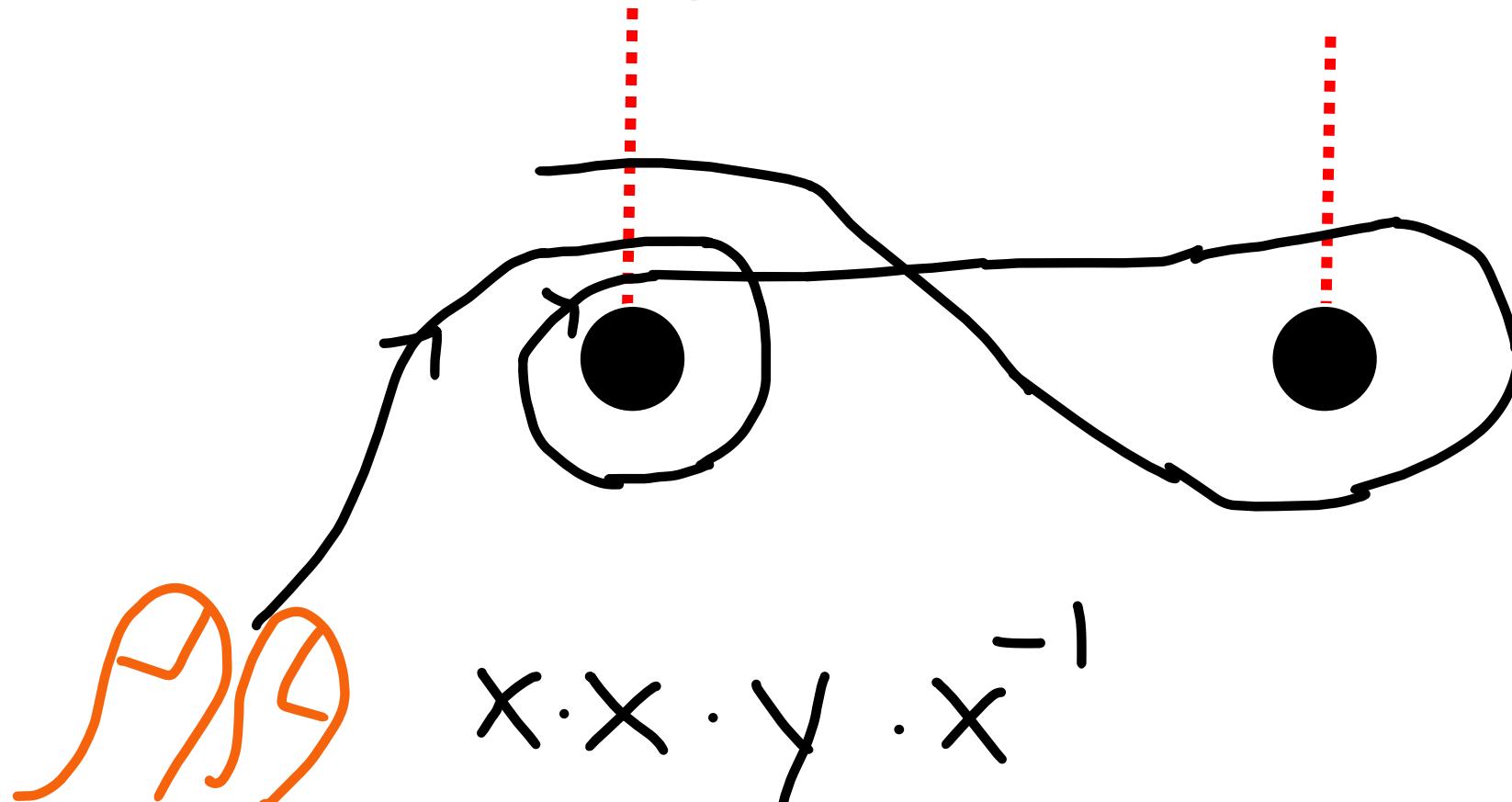


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

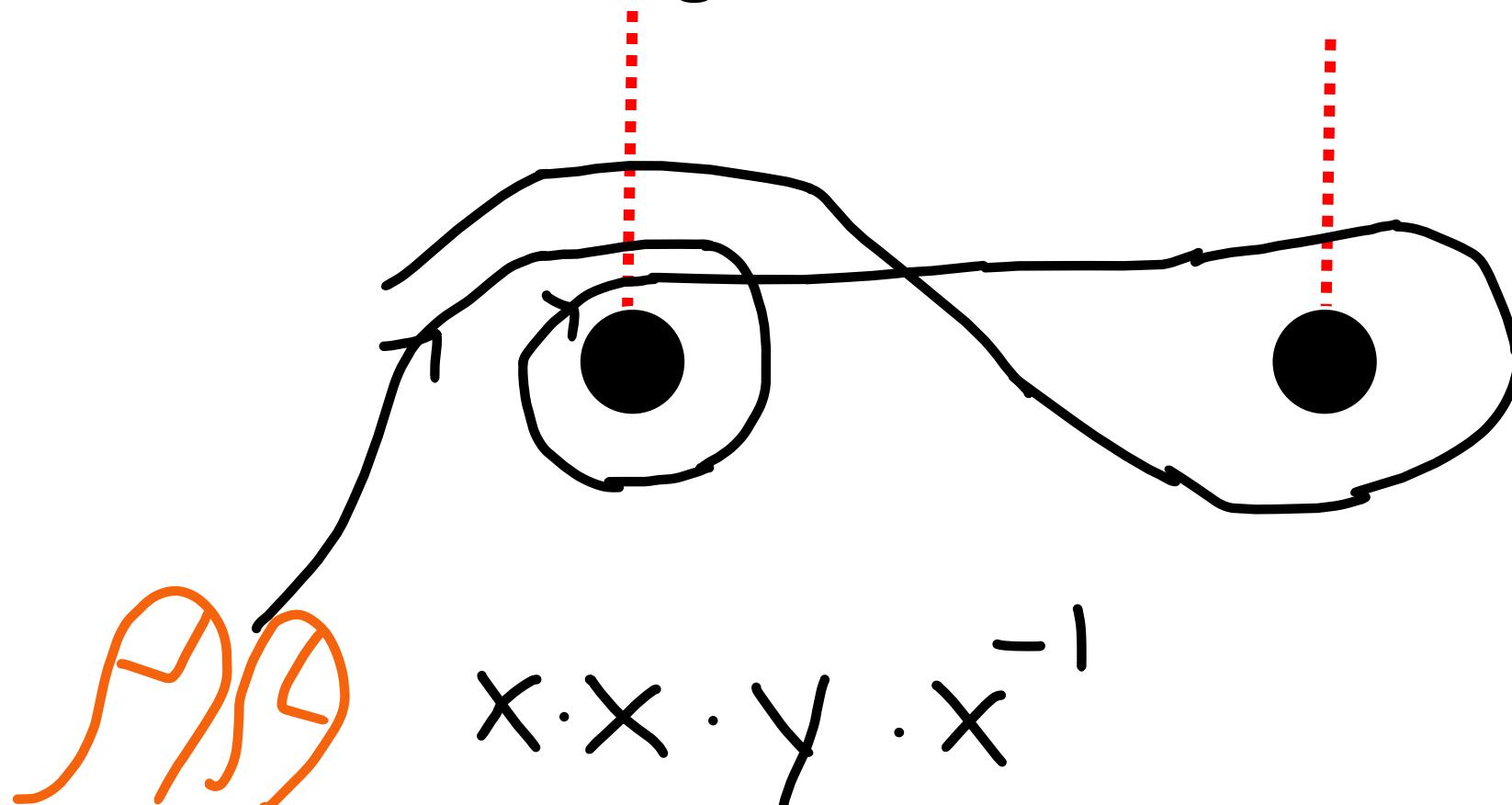


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

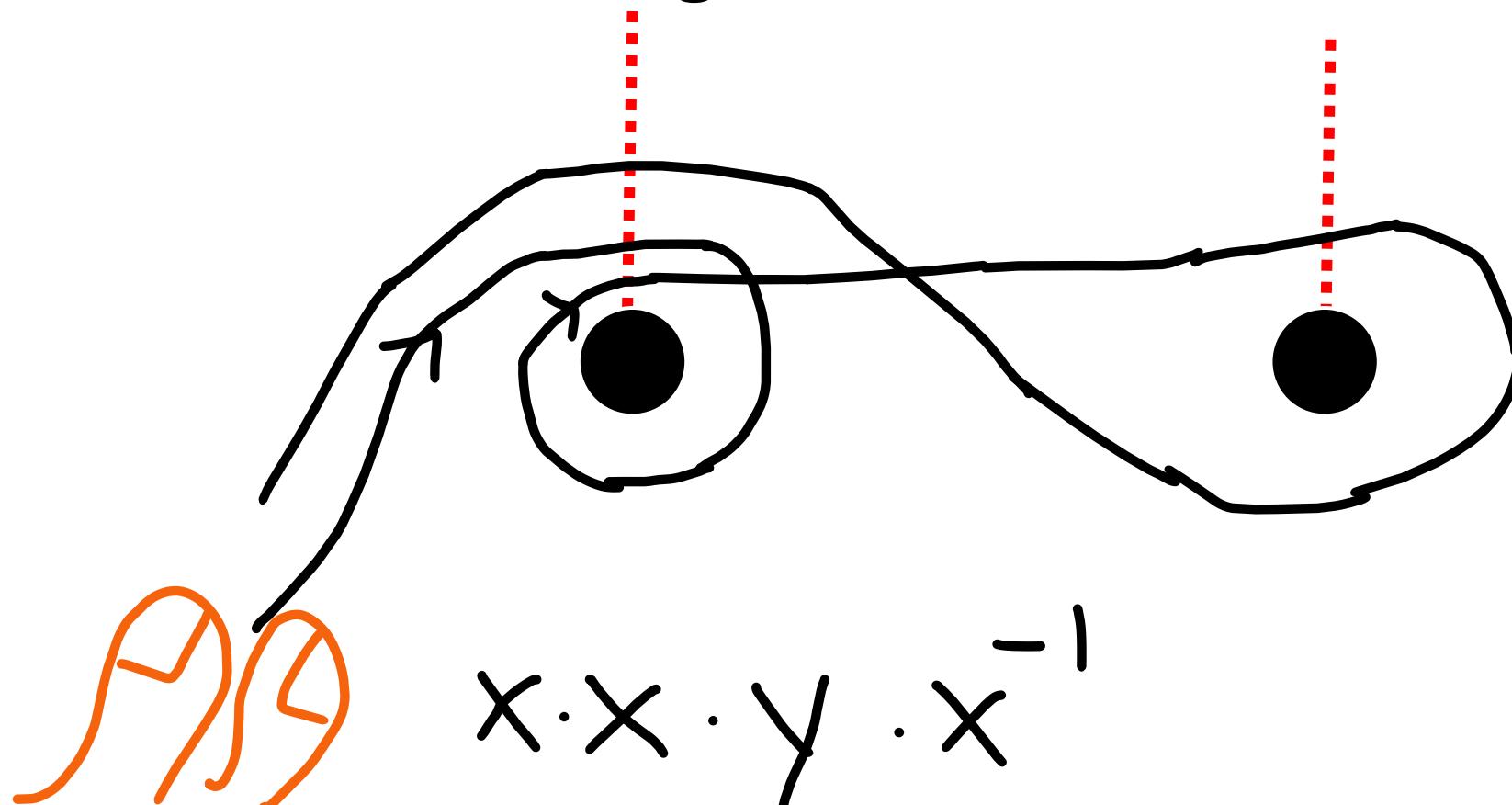


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$



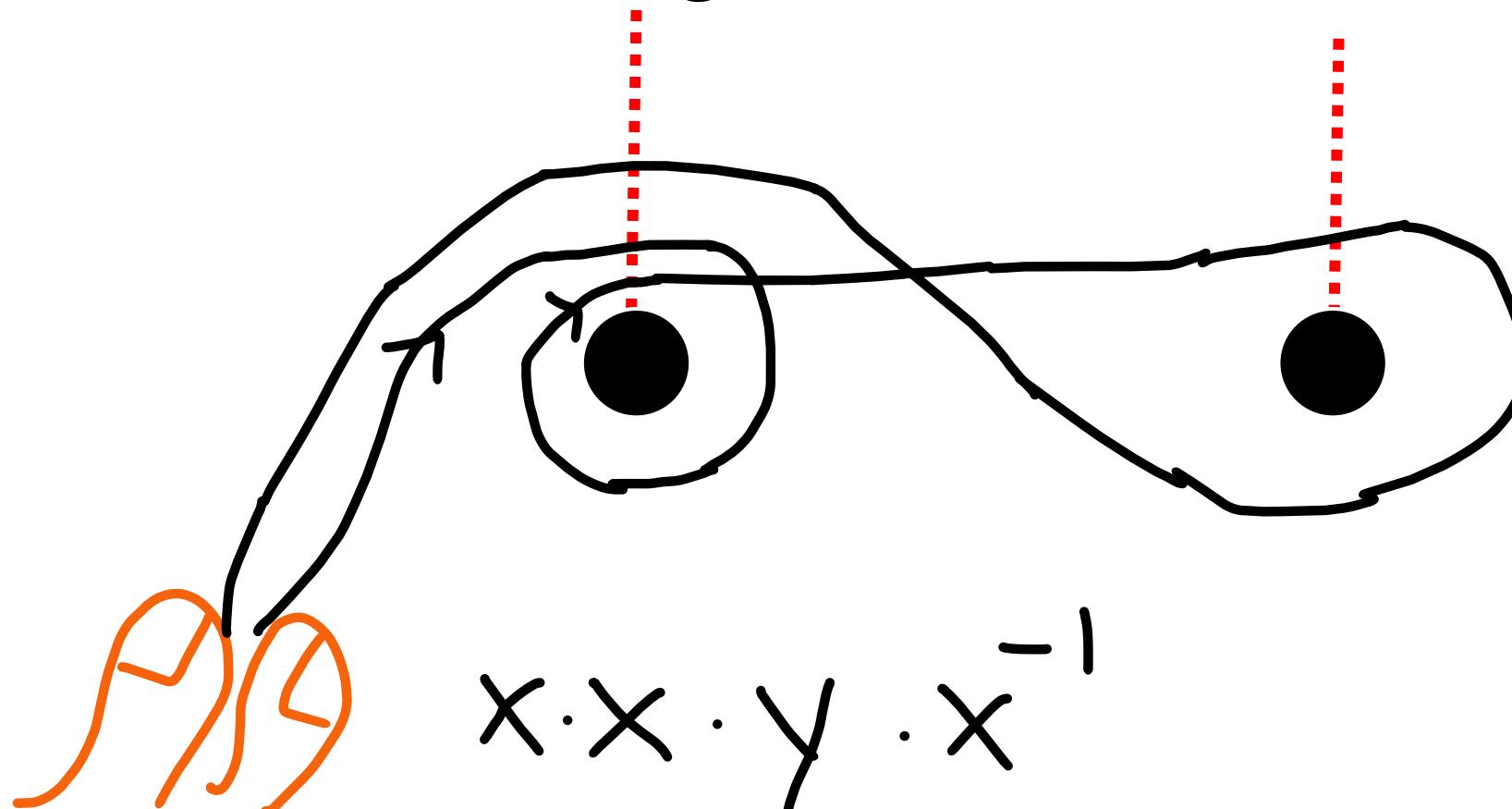
$x \cdot x \cdot y \cdot x^{-1}$

Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$



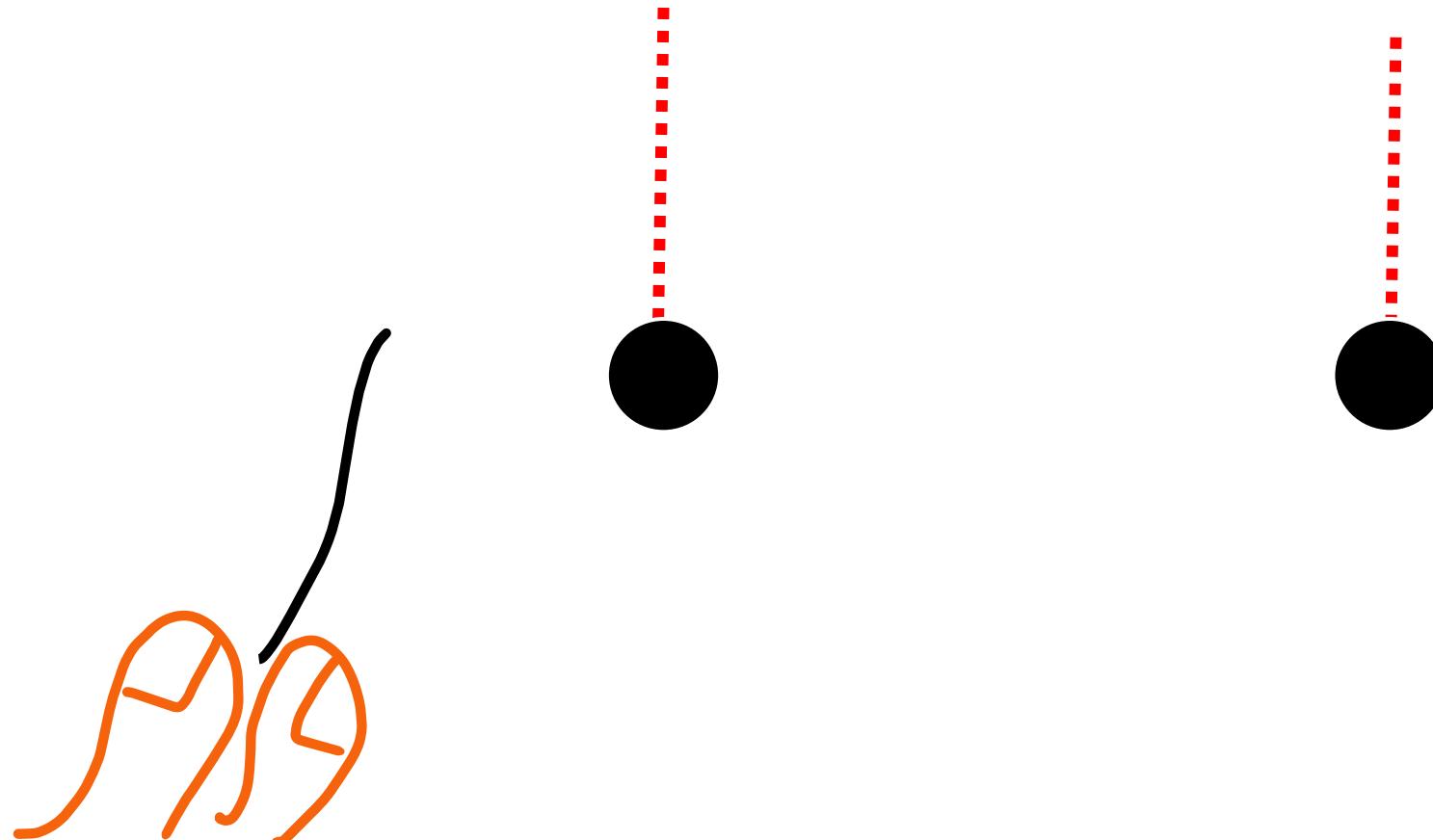
## Example 2

Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

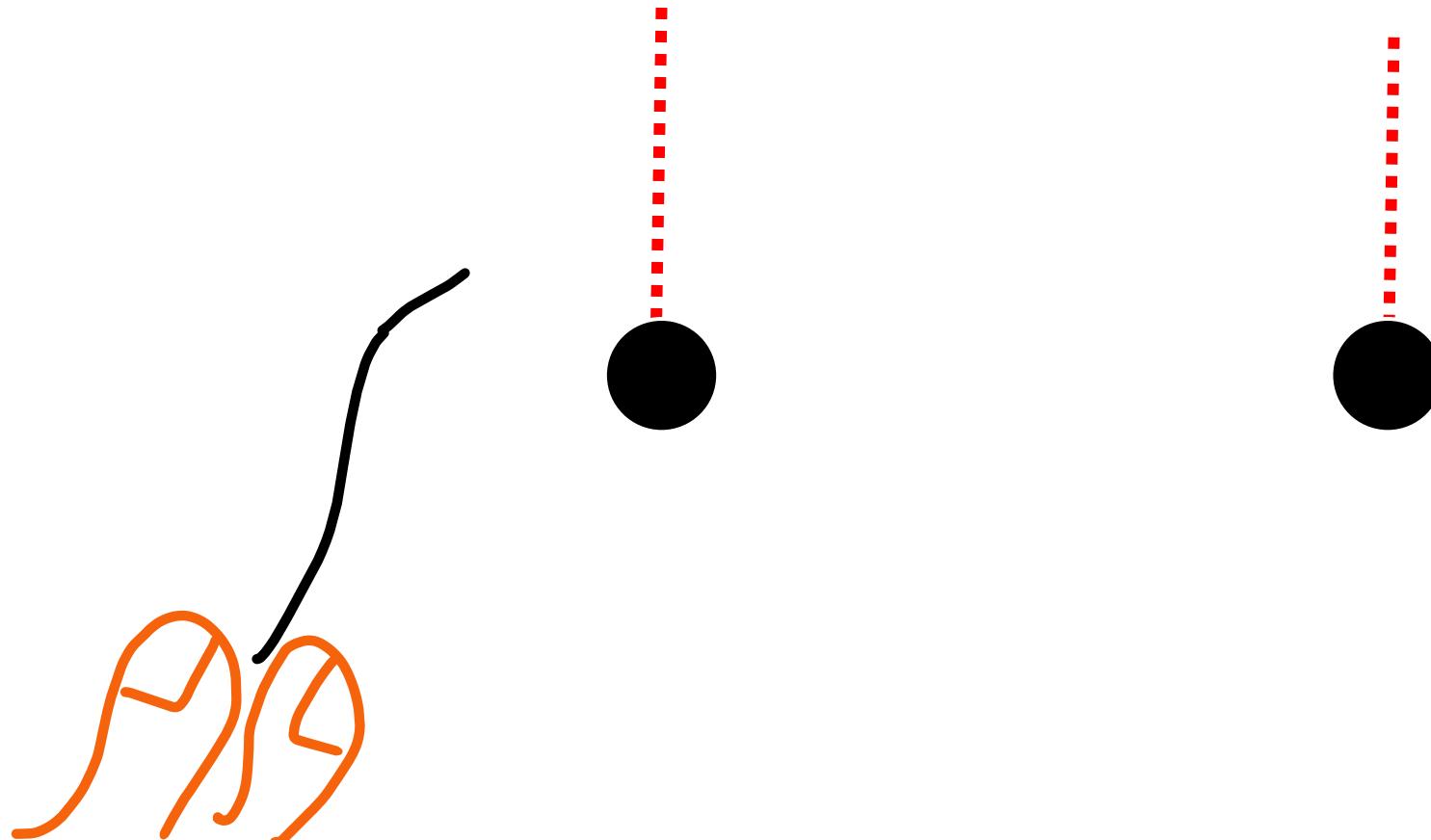


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

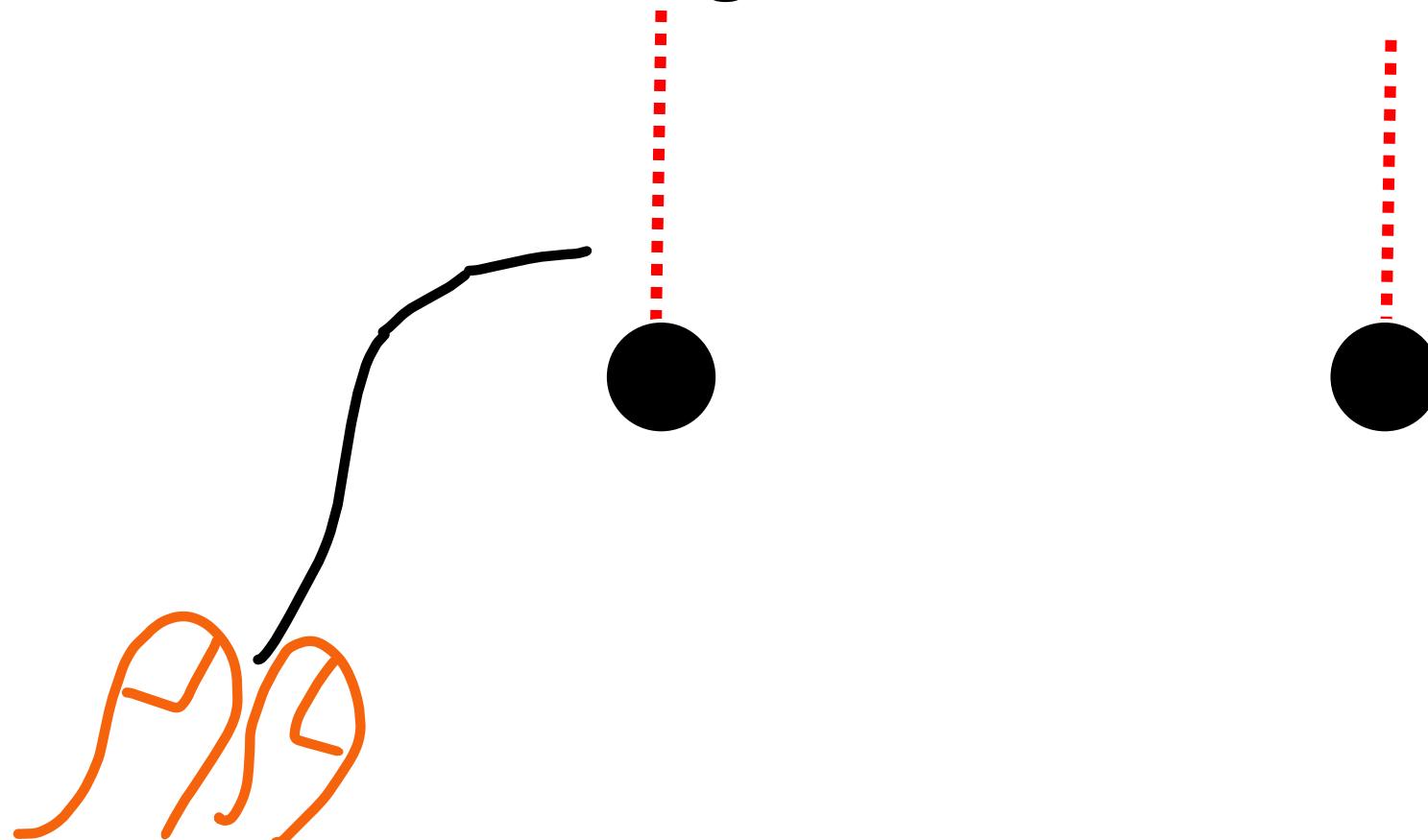


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

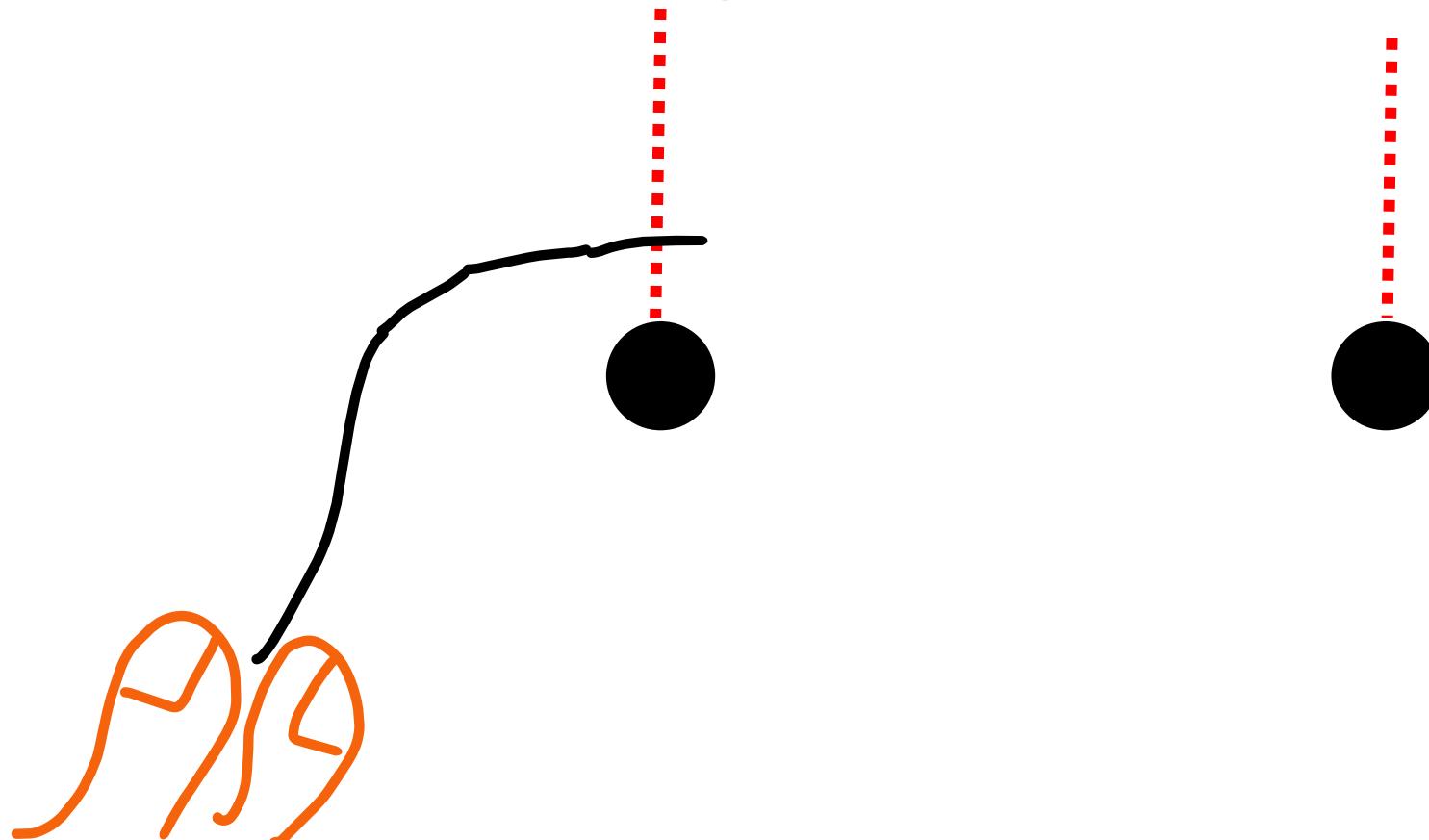


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

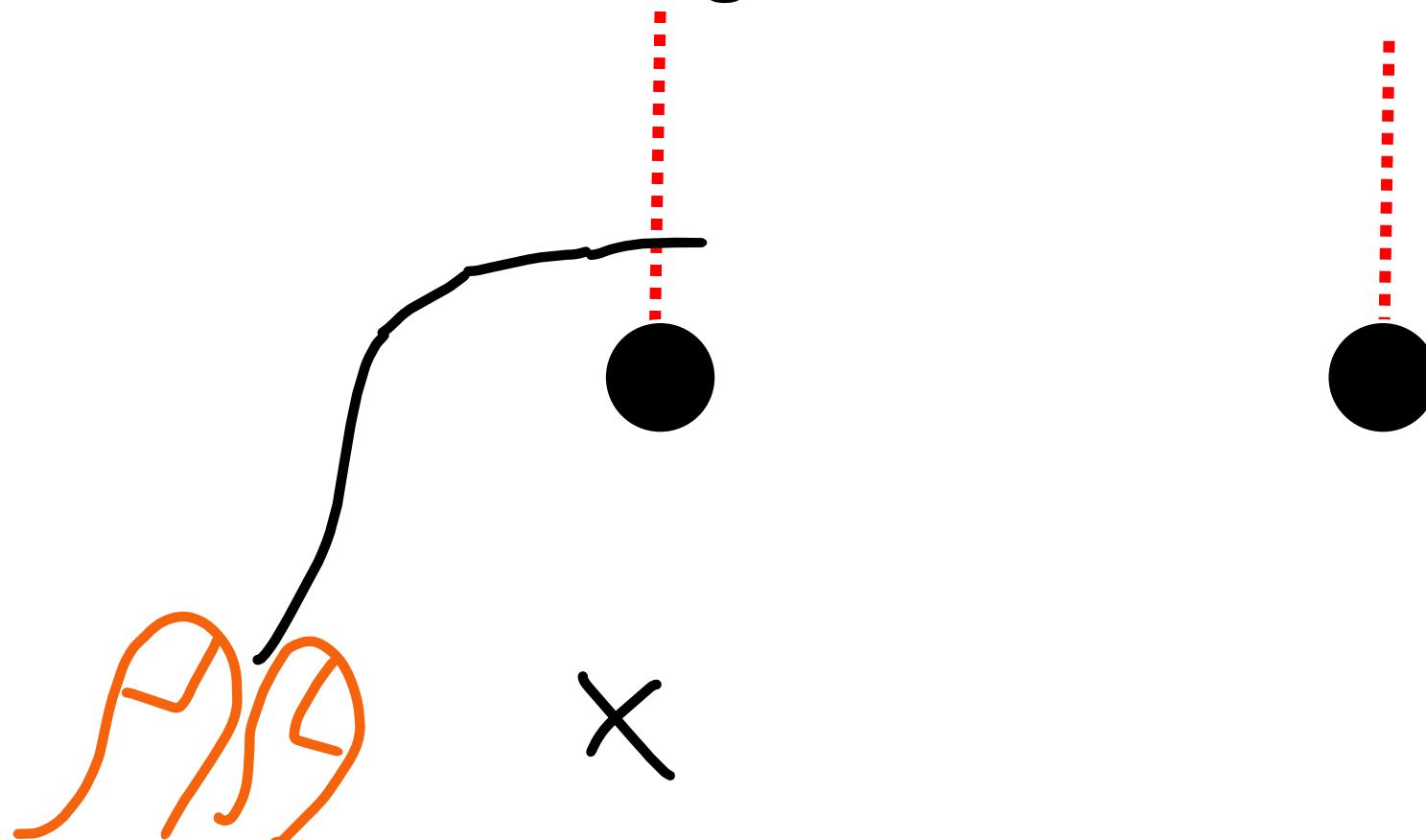


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

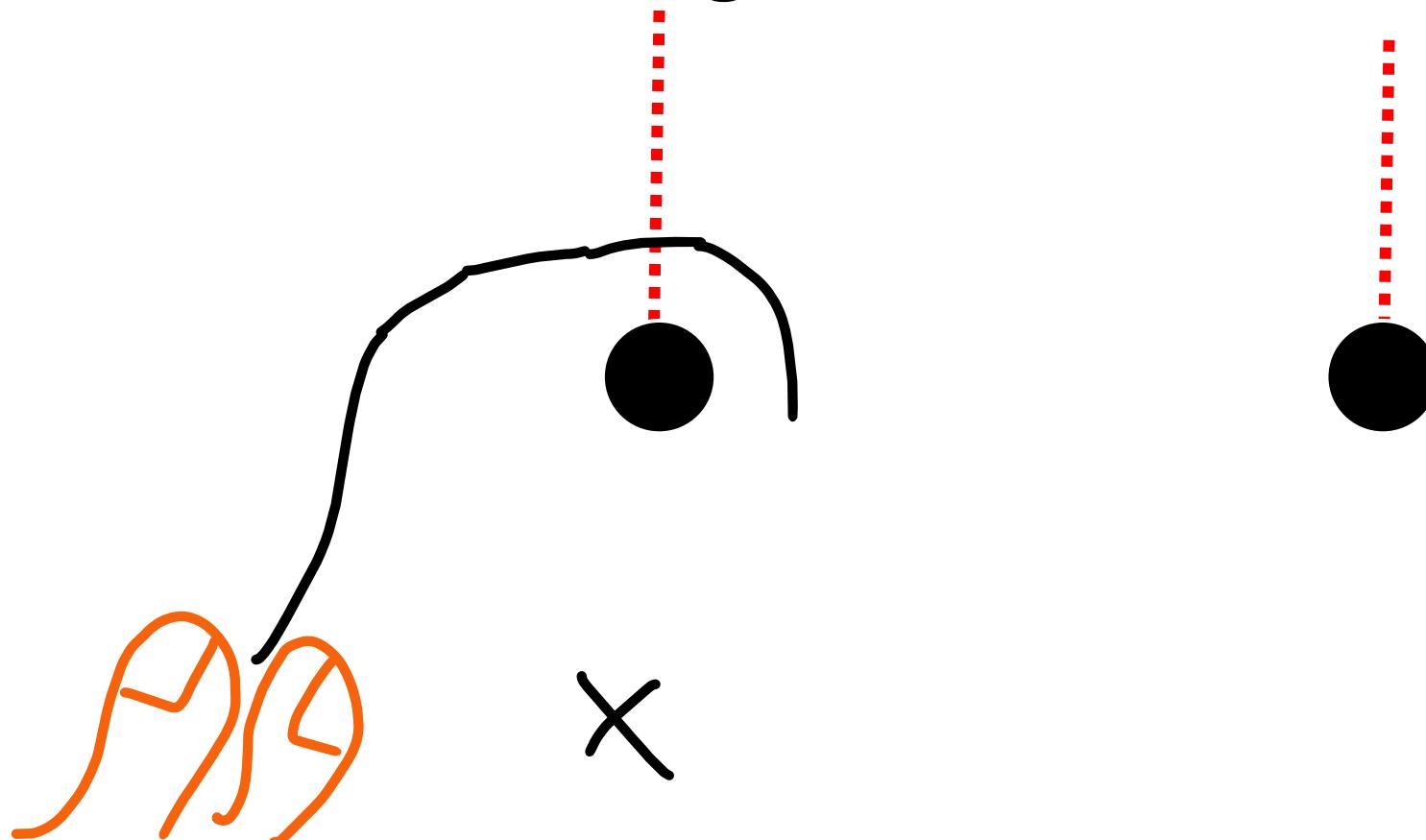


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

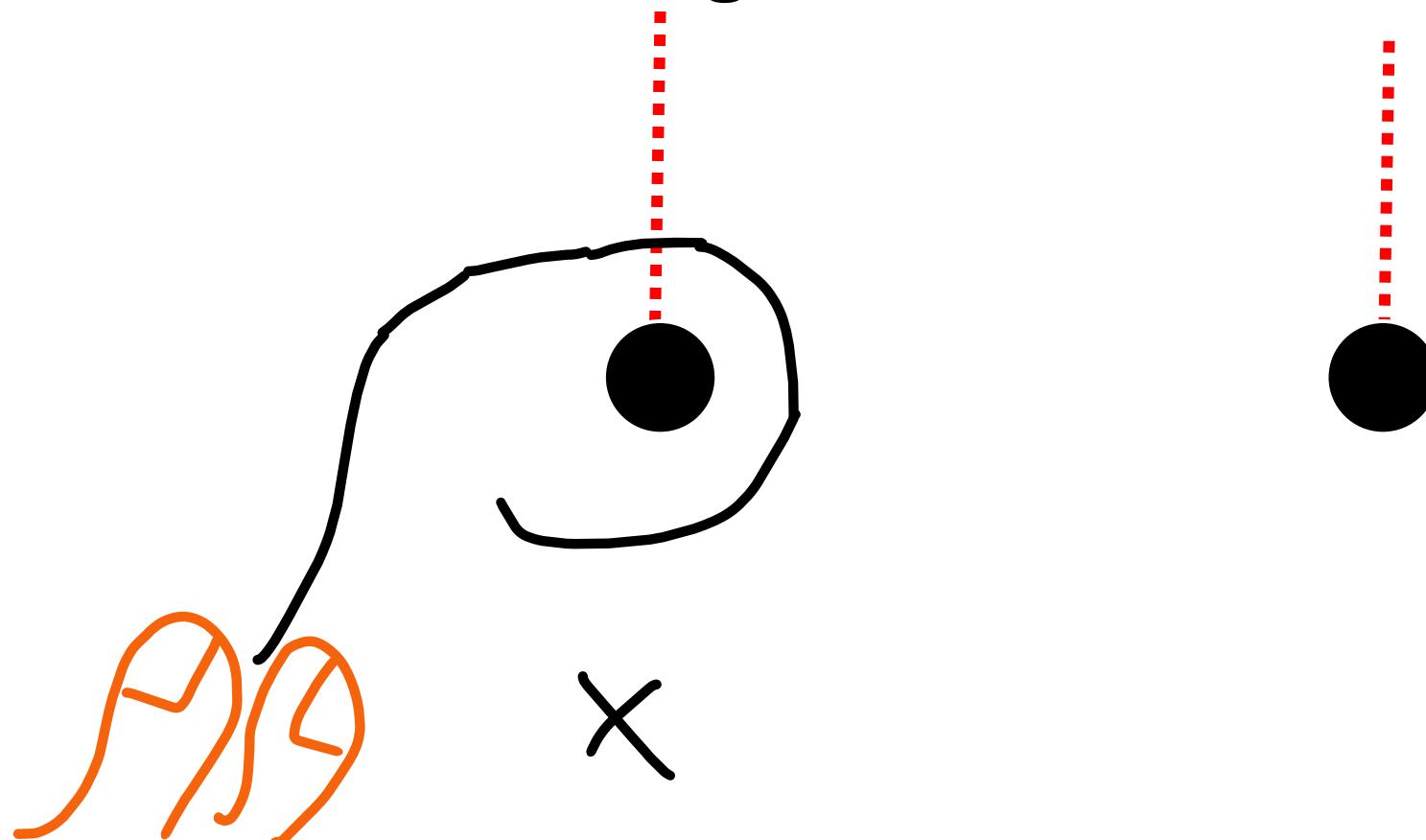


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

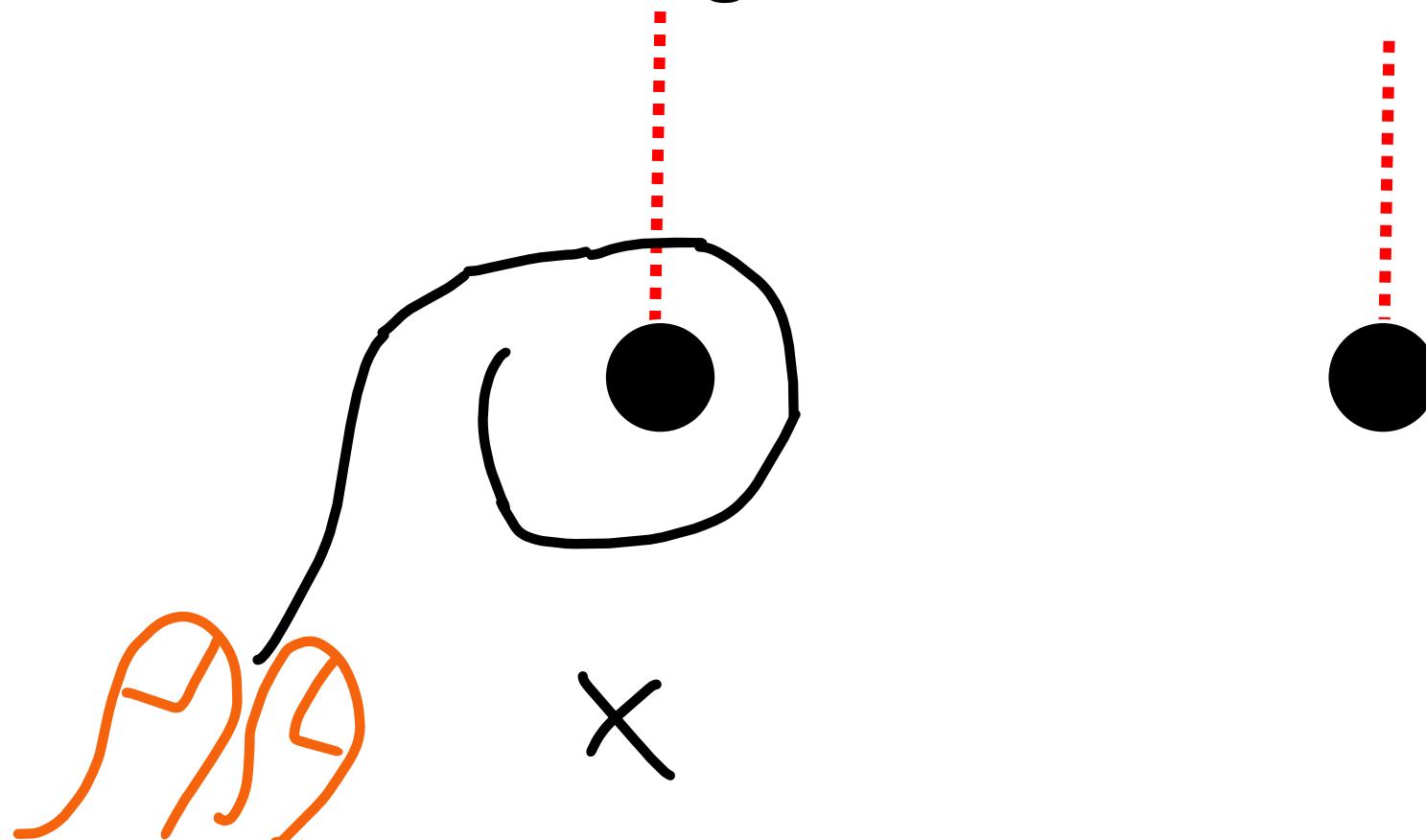


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

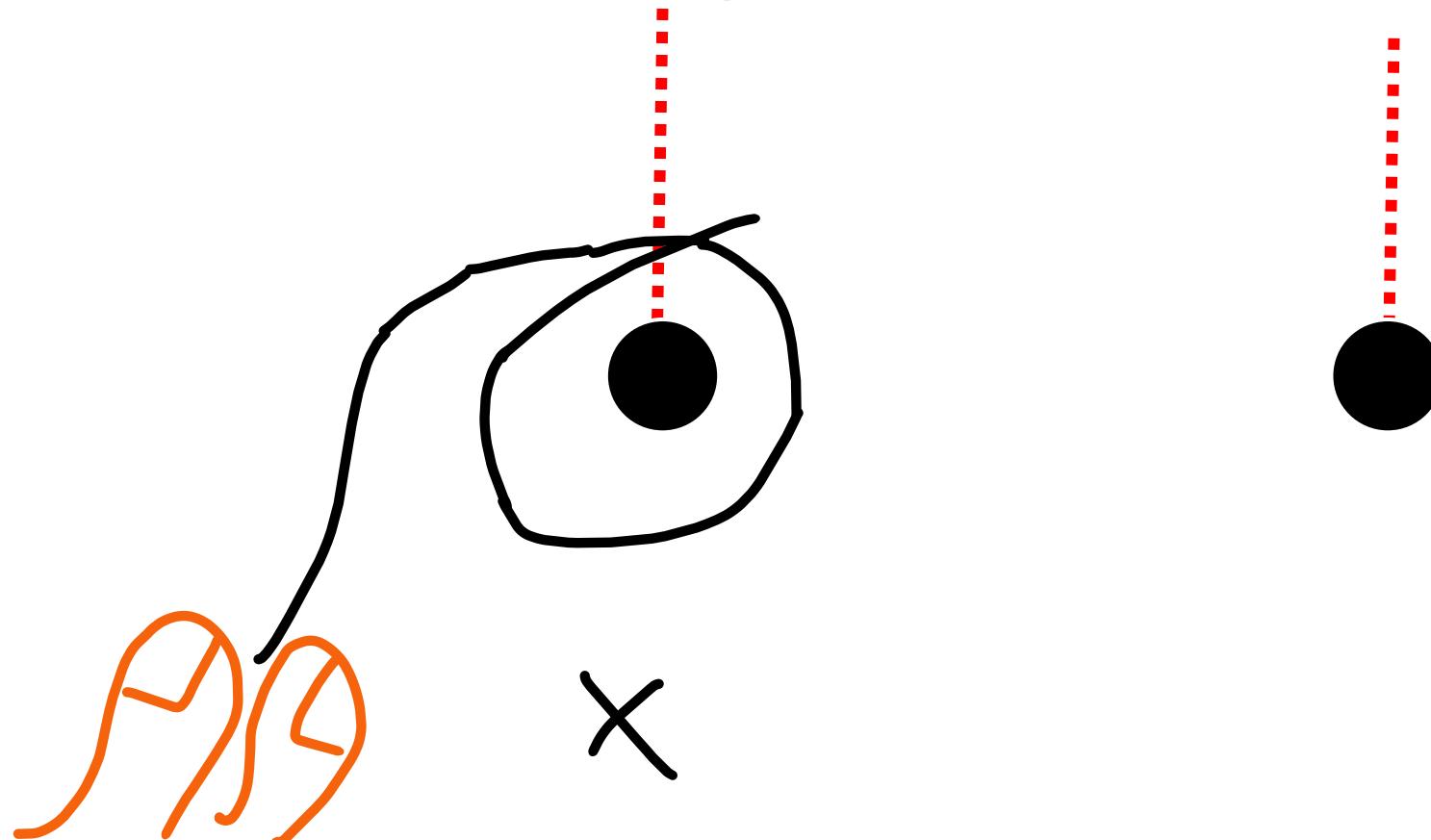


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

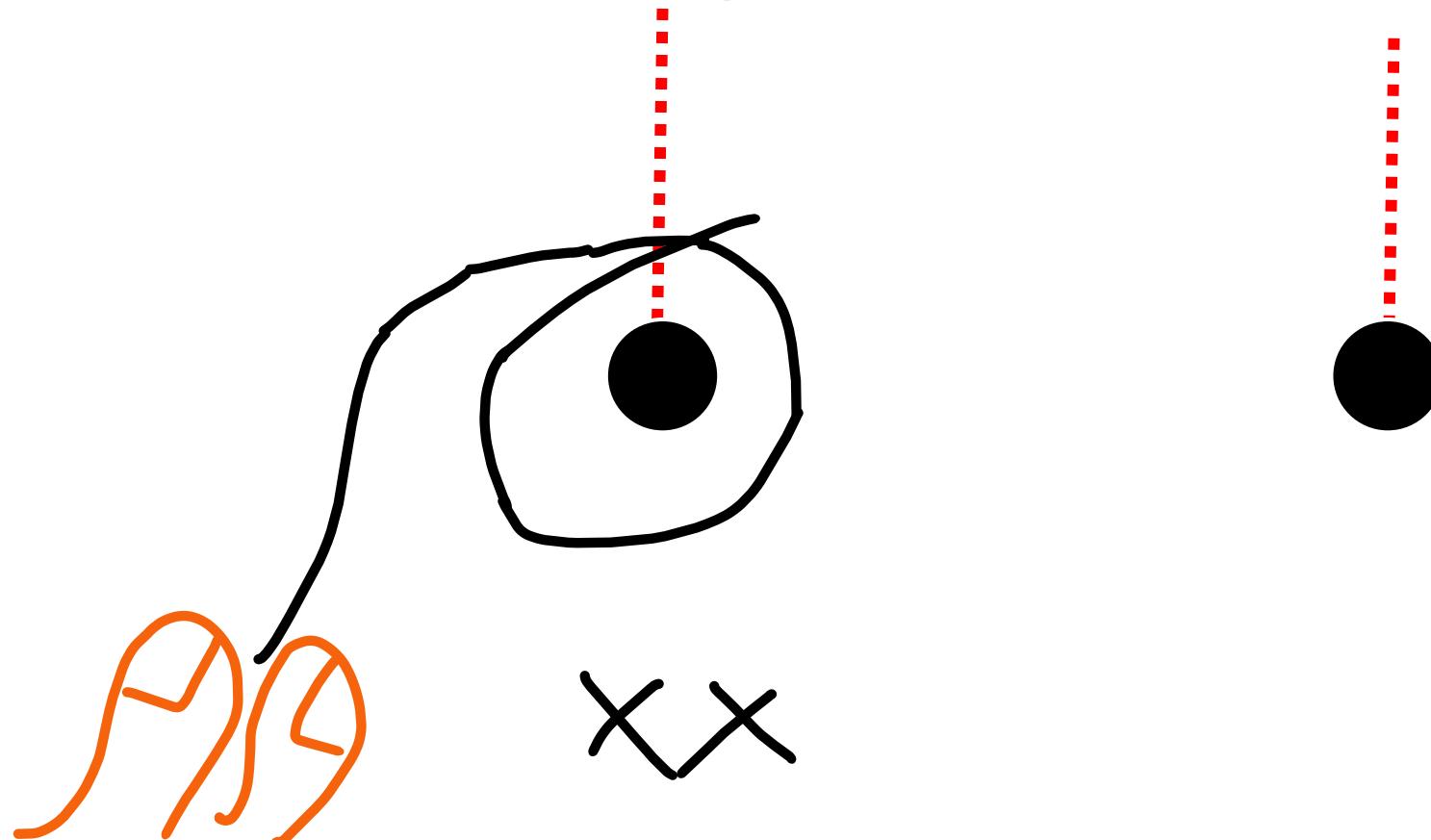


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

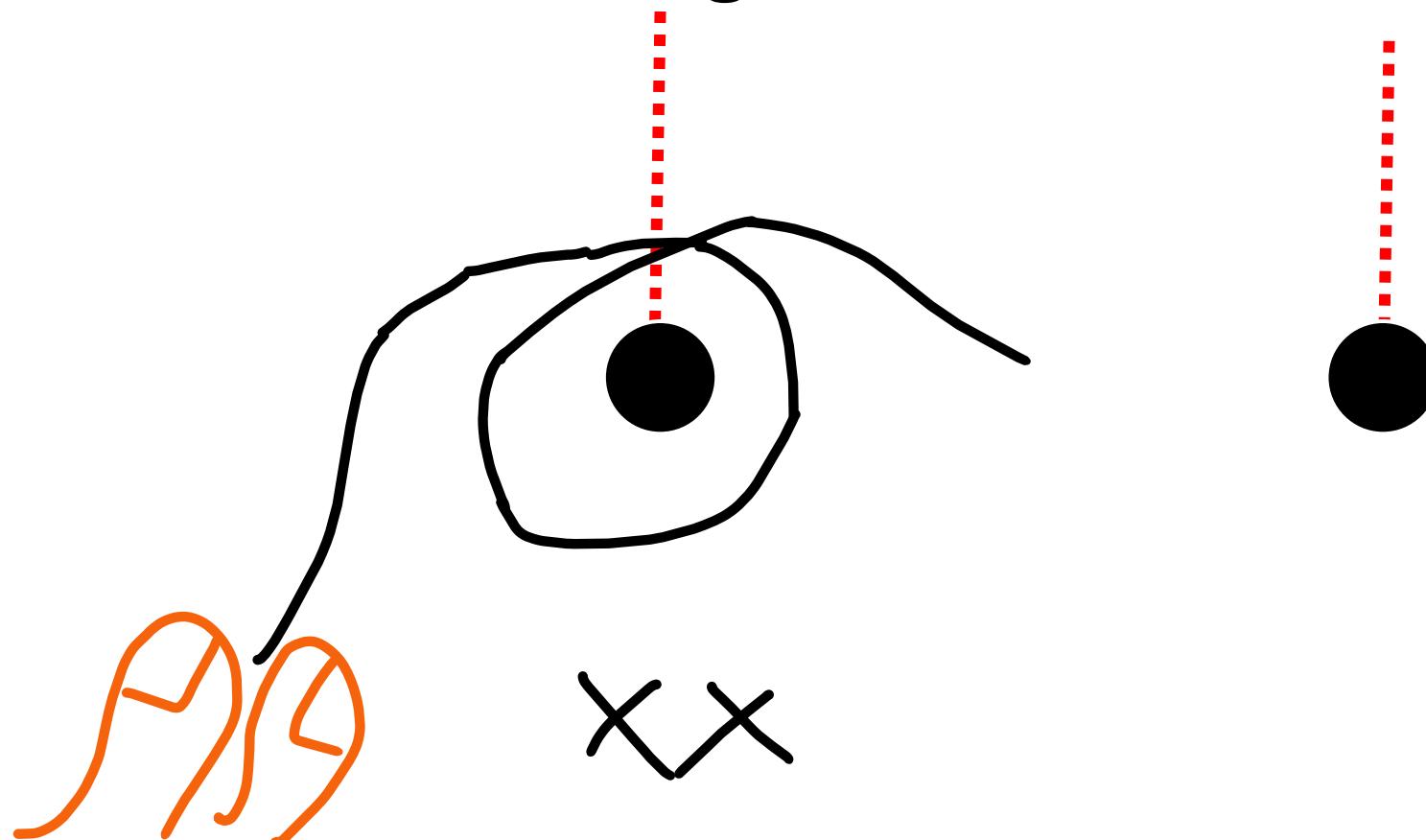


Cross over left nail clockwise: write  $x$

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Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

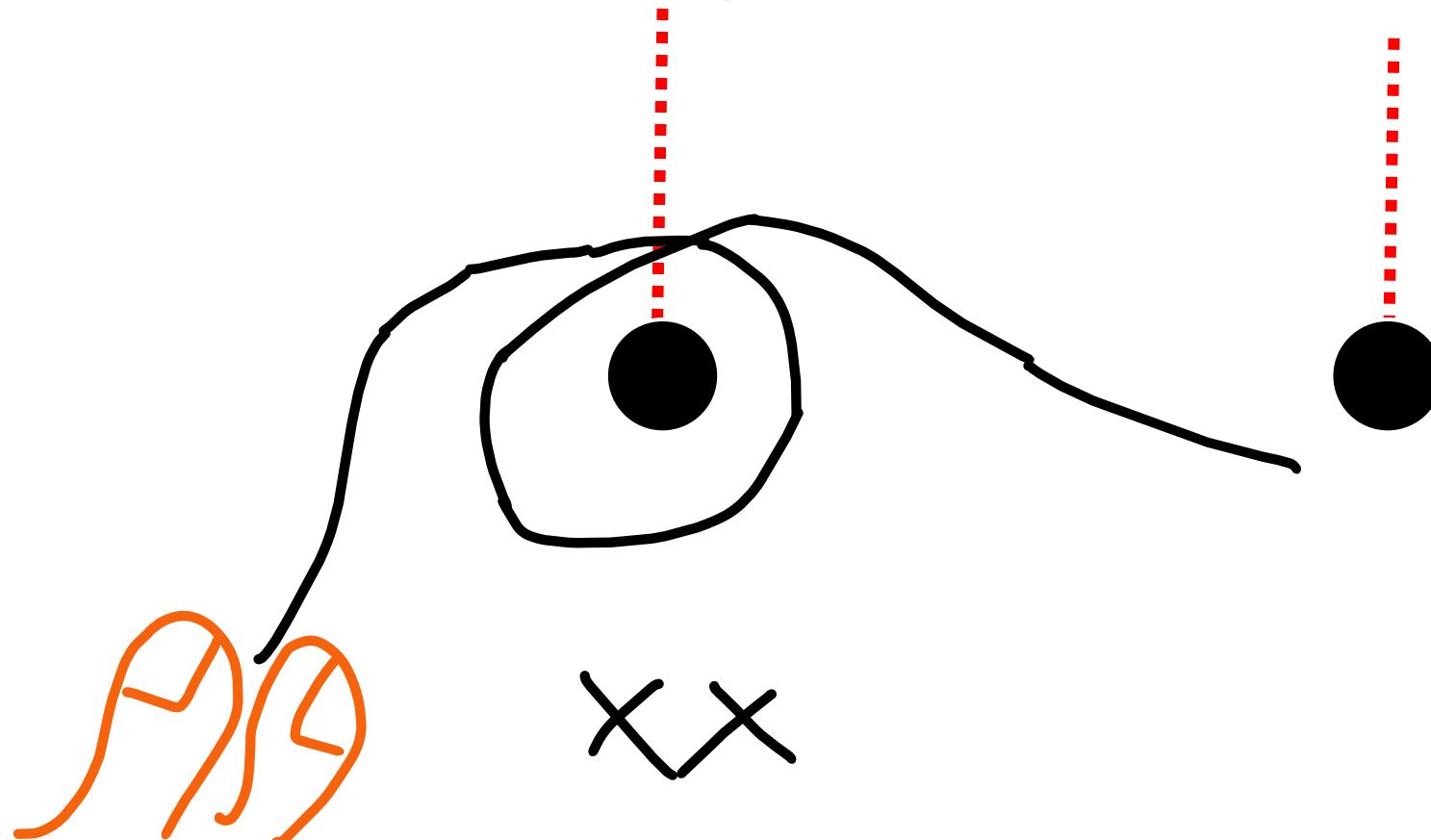


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

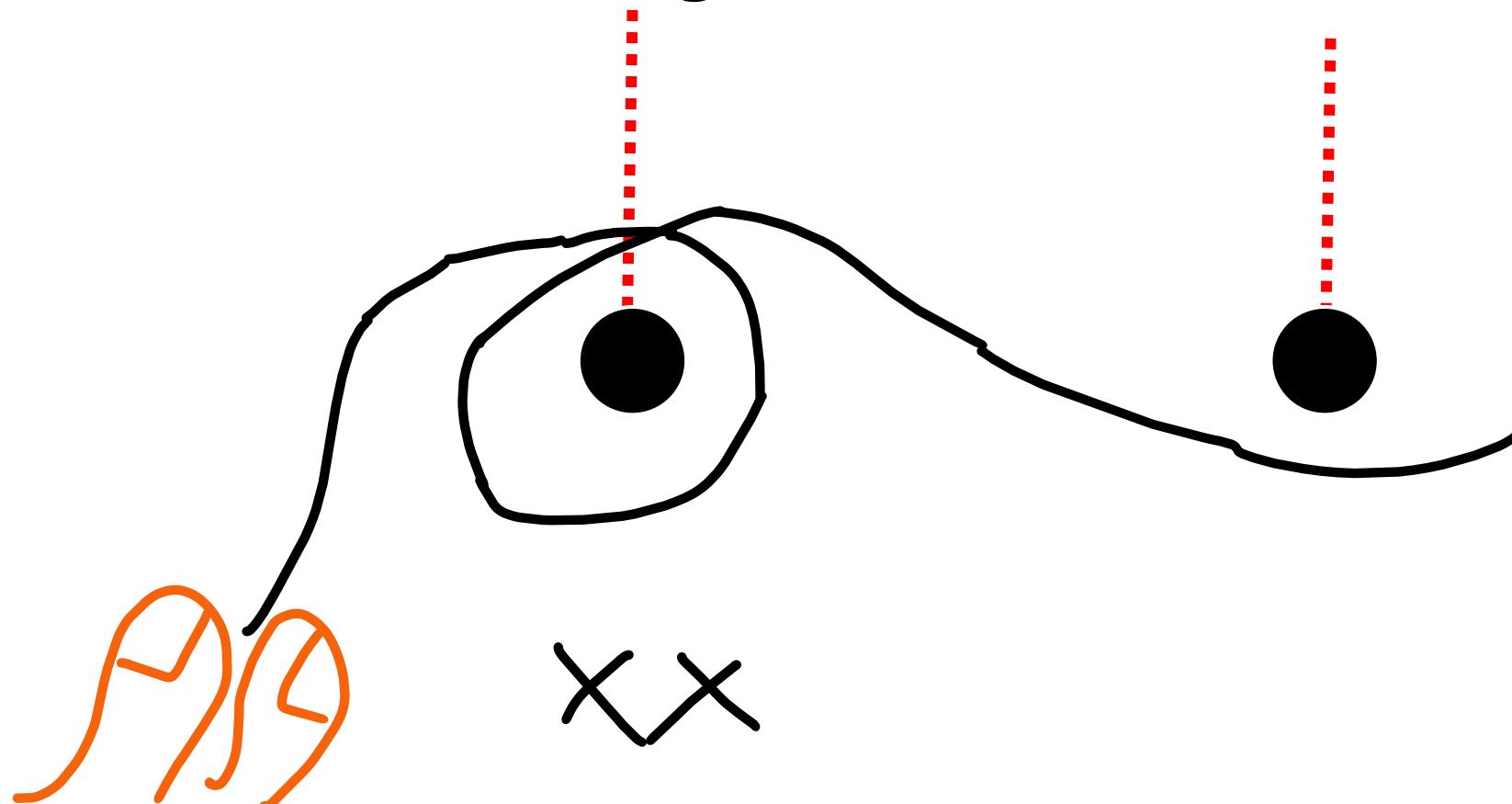


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

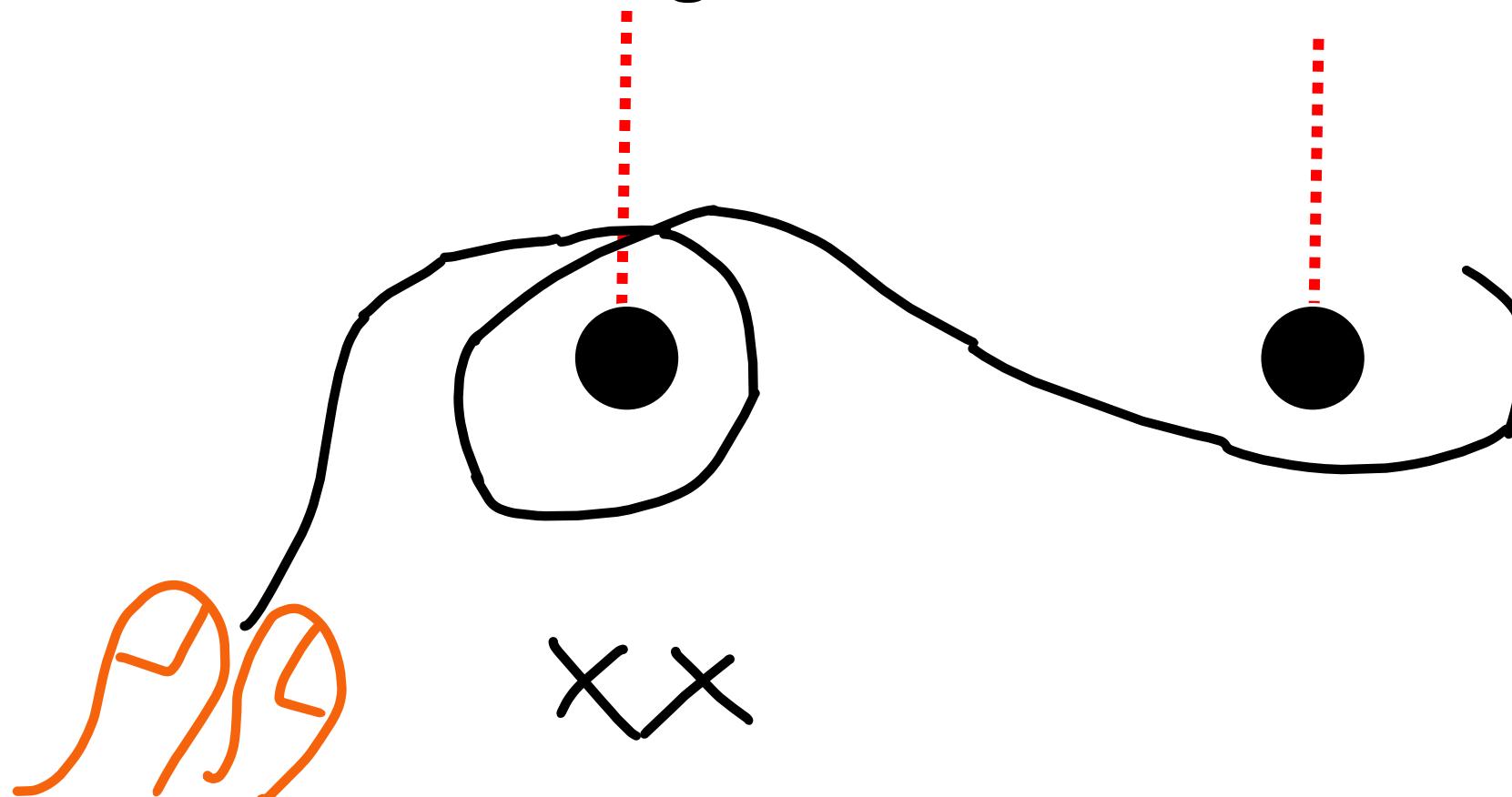


Cross over left nail clockwise: write  $x$

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Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

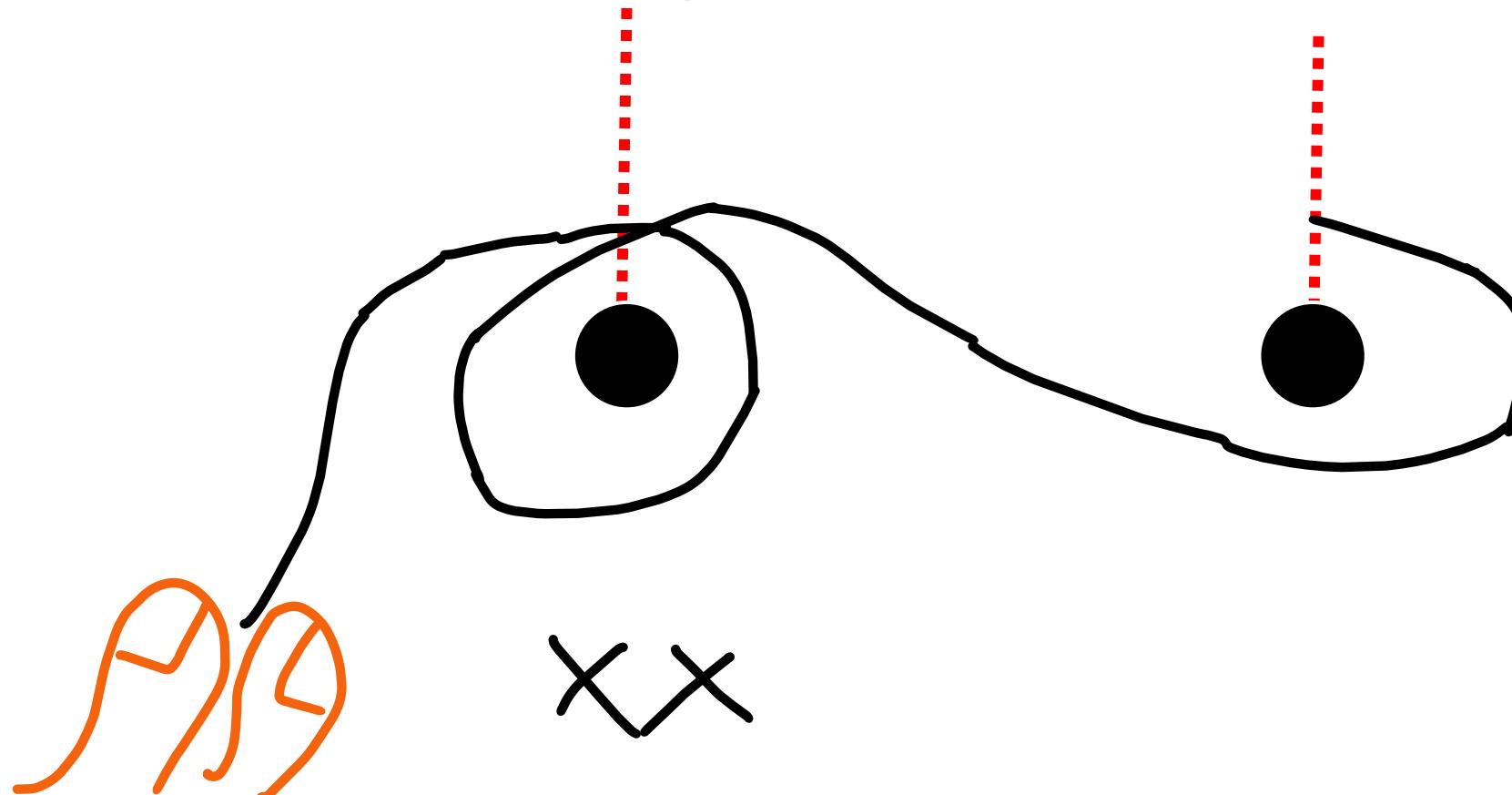


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

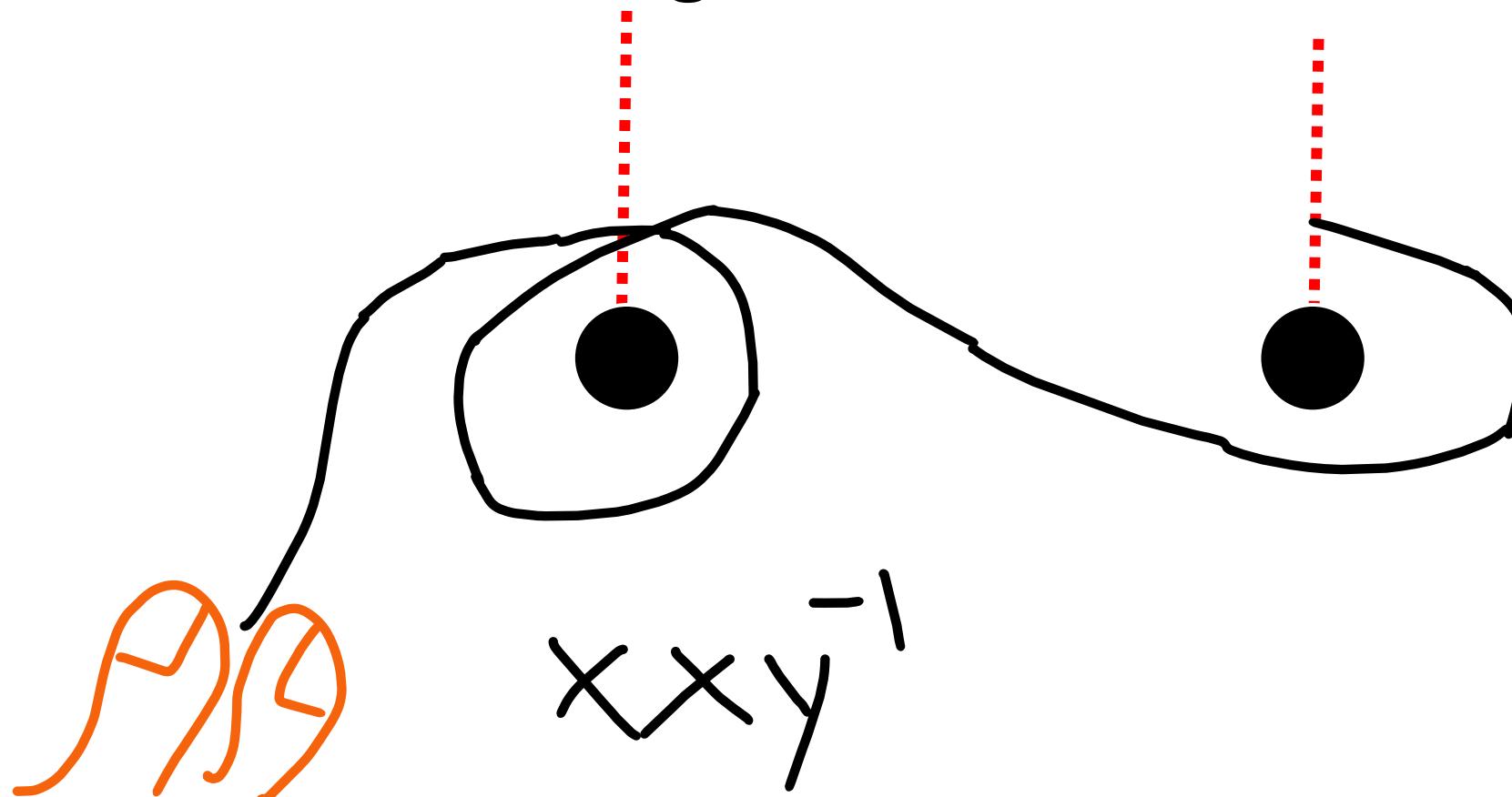


Cross over left nail clockwise: write  $x$

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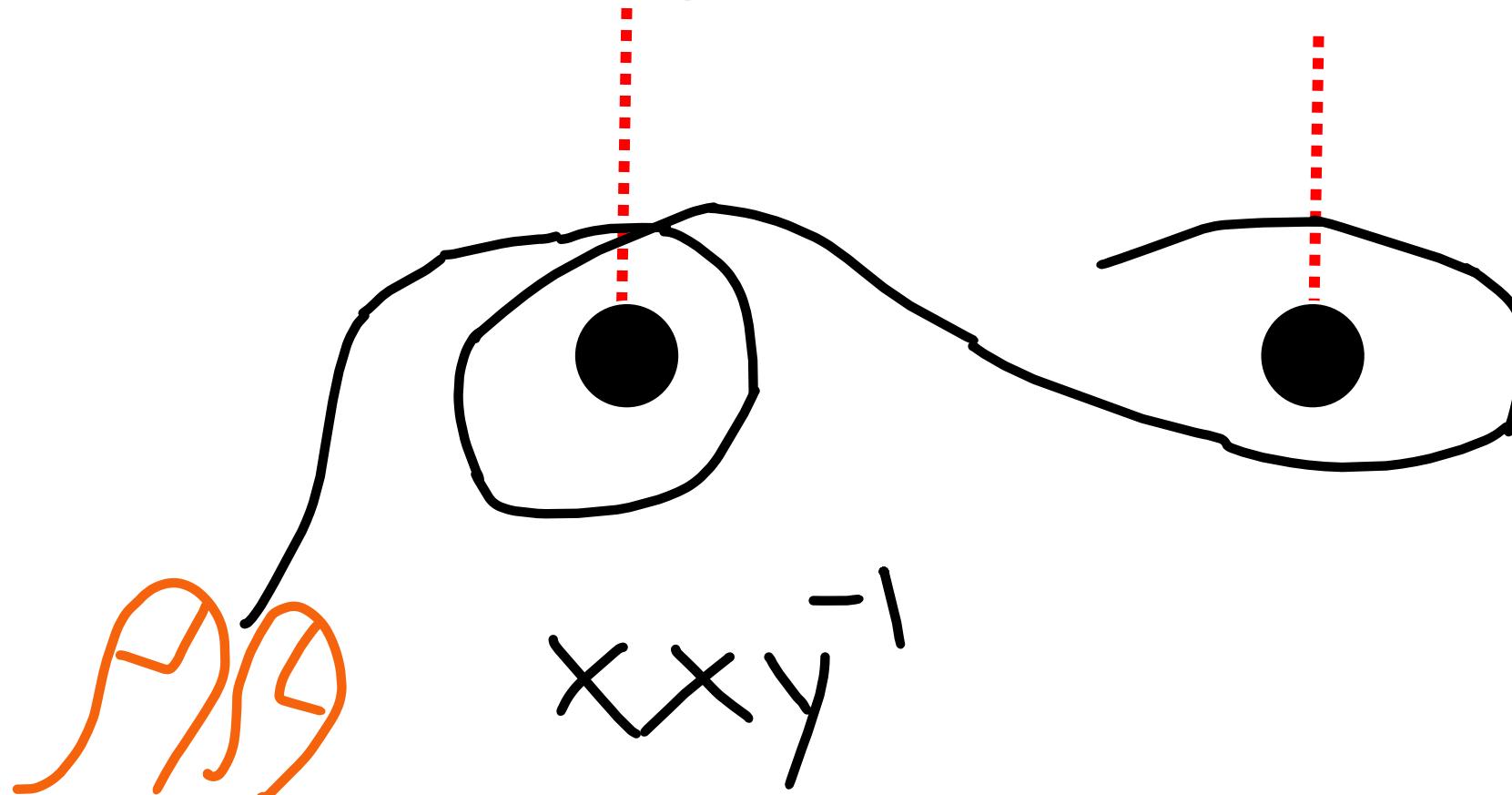


Cross over left nail clockwise: write  $x$

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Cross over right nail clockwise: write  $y$

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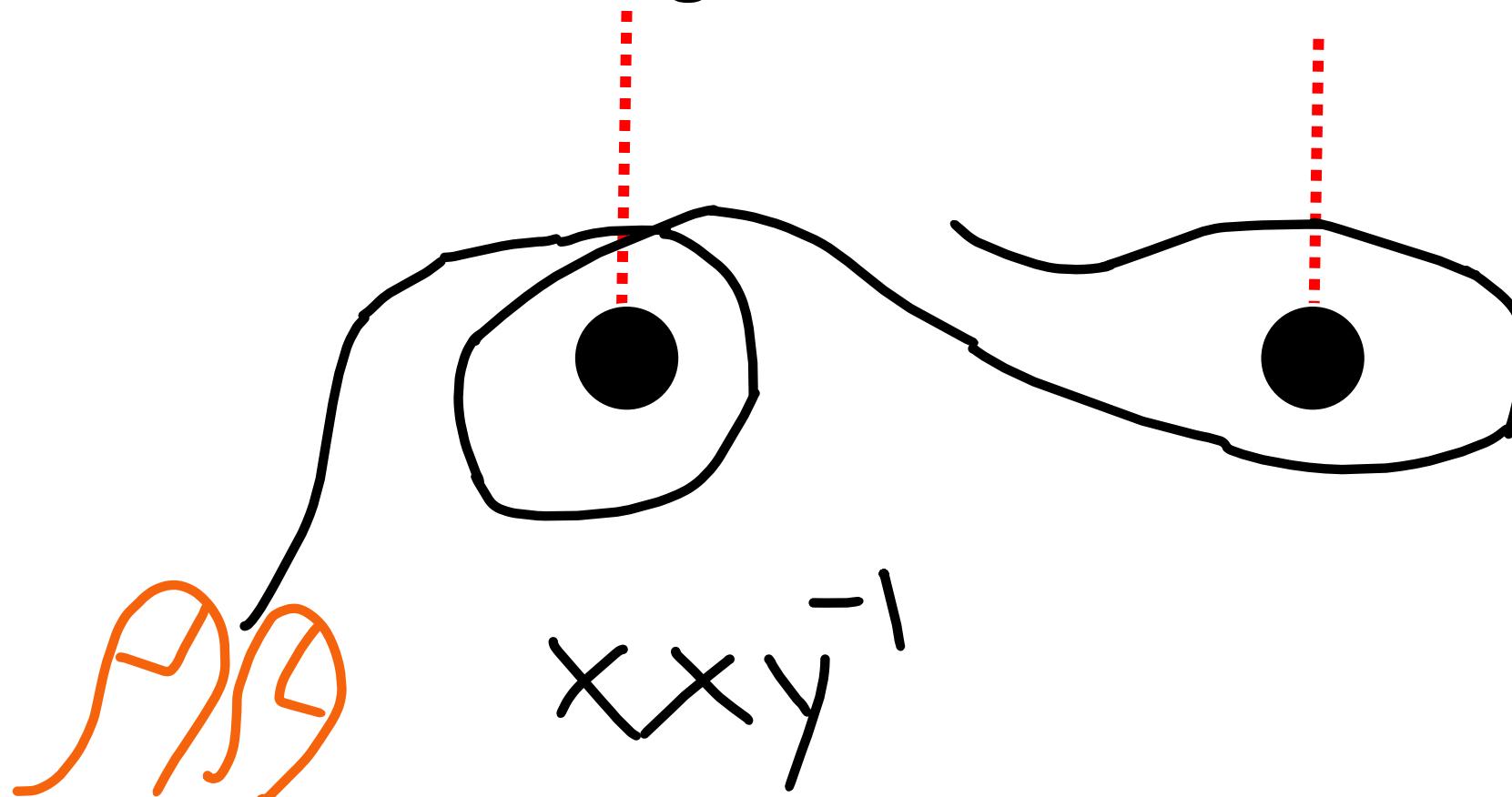


Cross over left nail clockwise: write  $x$

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Cross over right nail clockwise: write  $y$

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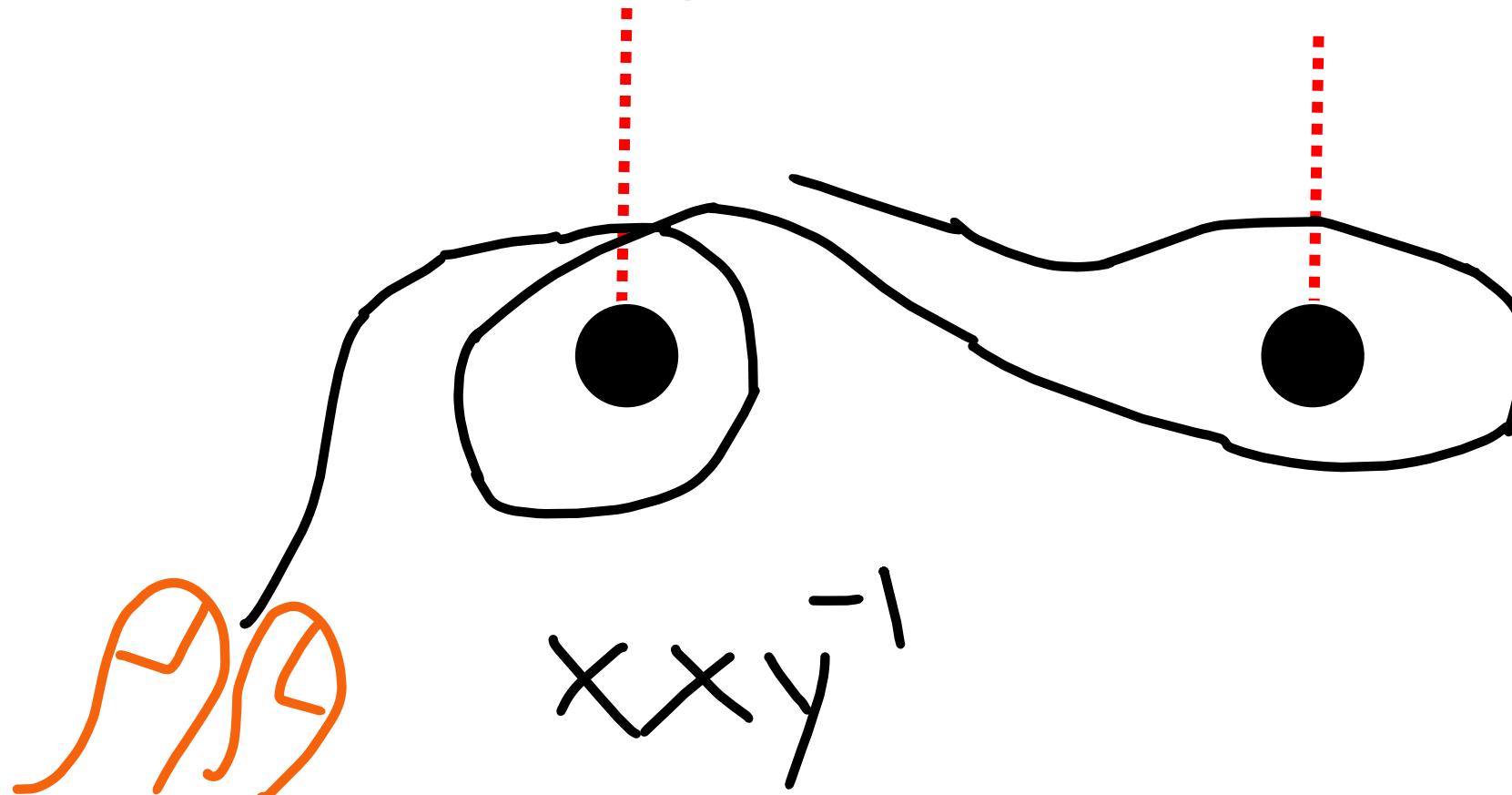


Cross over left nail clockwise: write  $x$

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Cross over right nail clockwise: write  $y$

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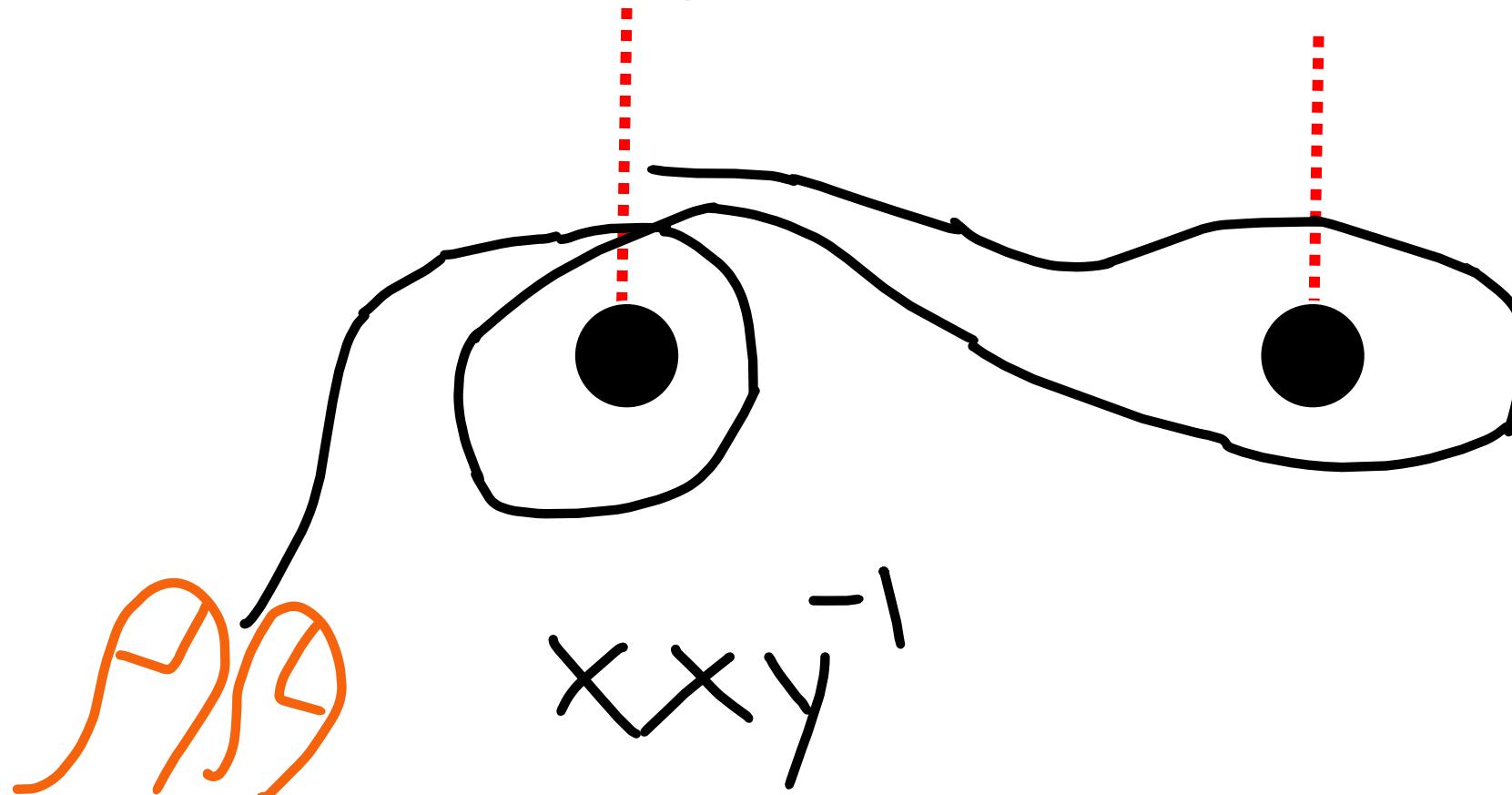


Cross over left nail clockwise: write  $x$

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Cross over right nail clockwise: write  $y$

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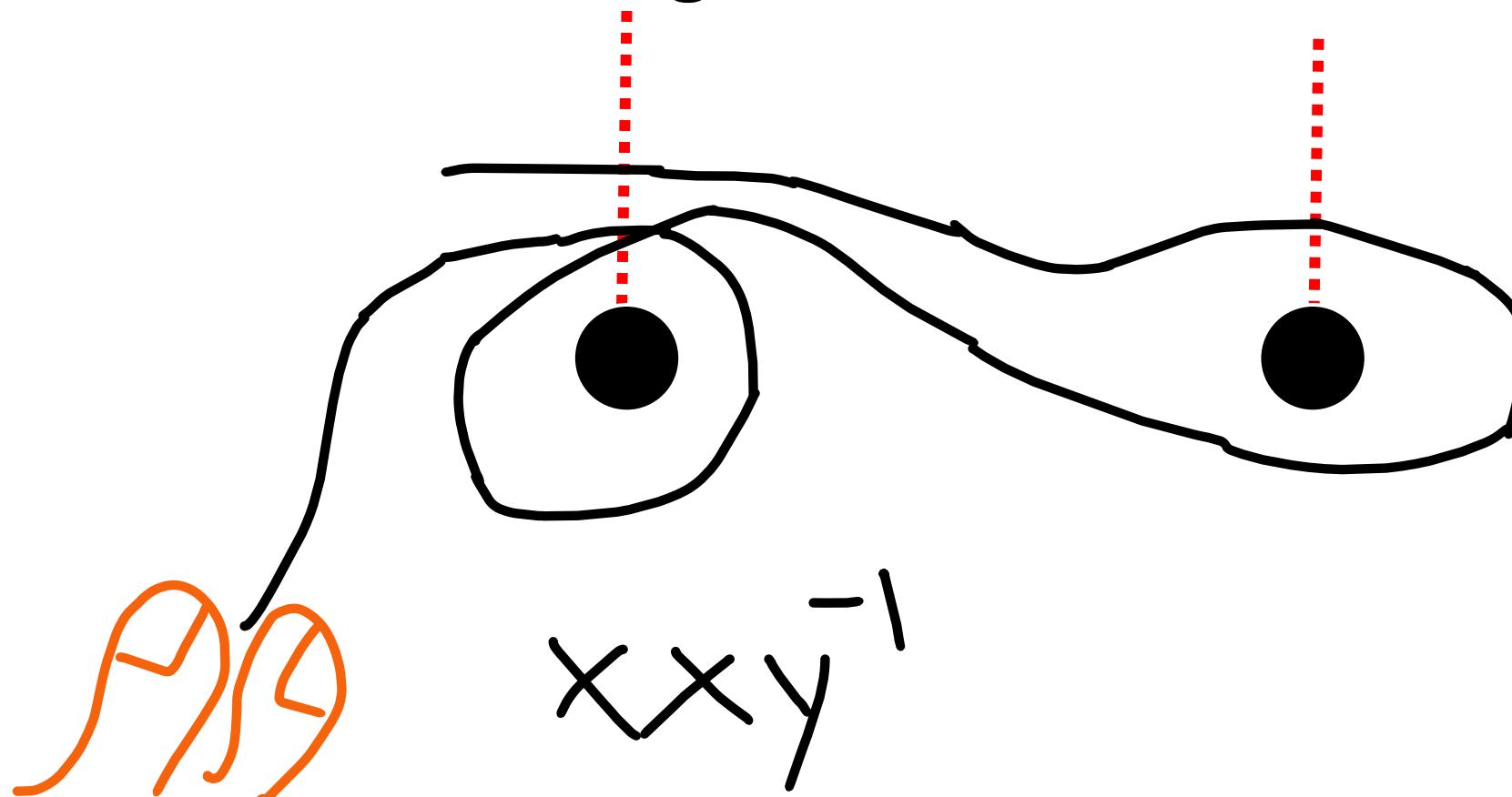


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Cross over right nail clockwise: write  $y$

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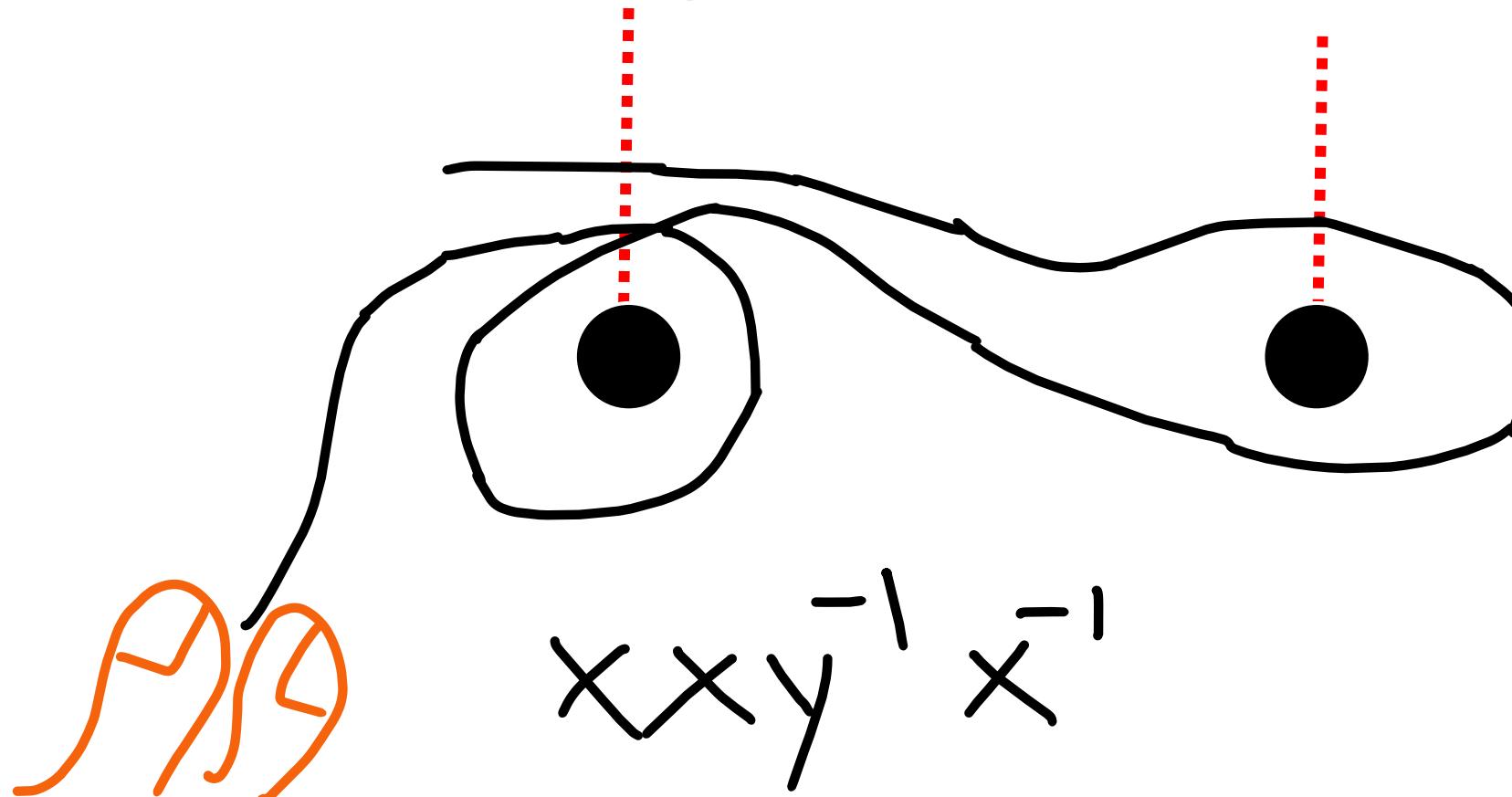


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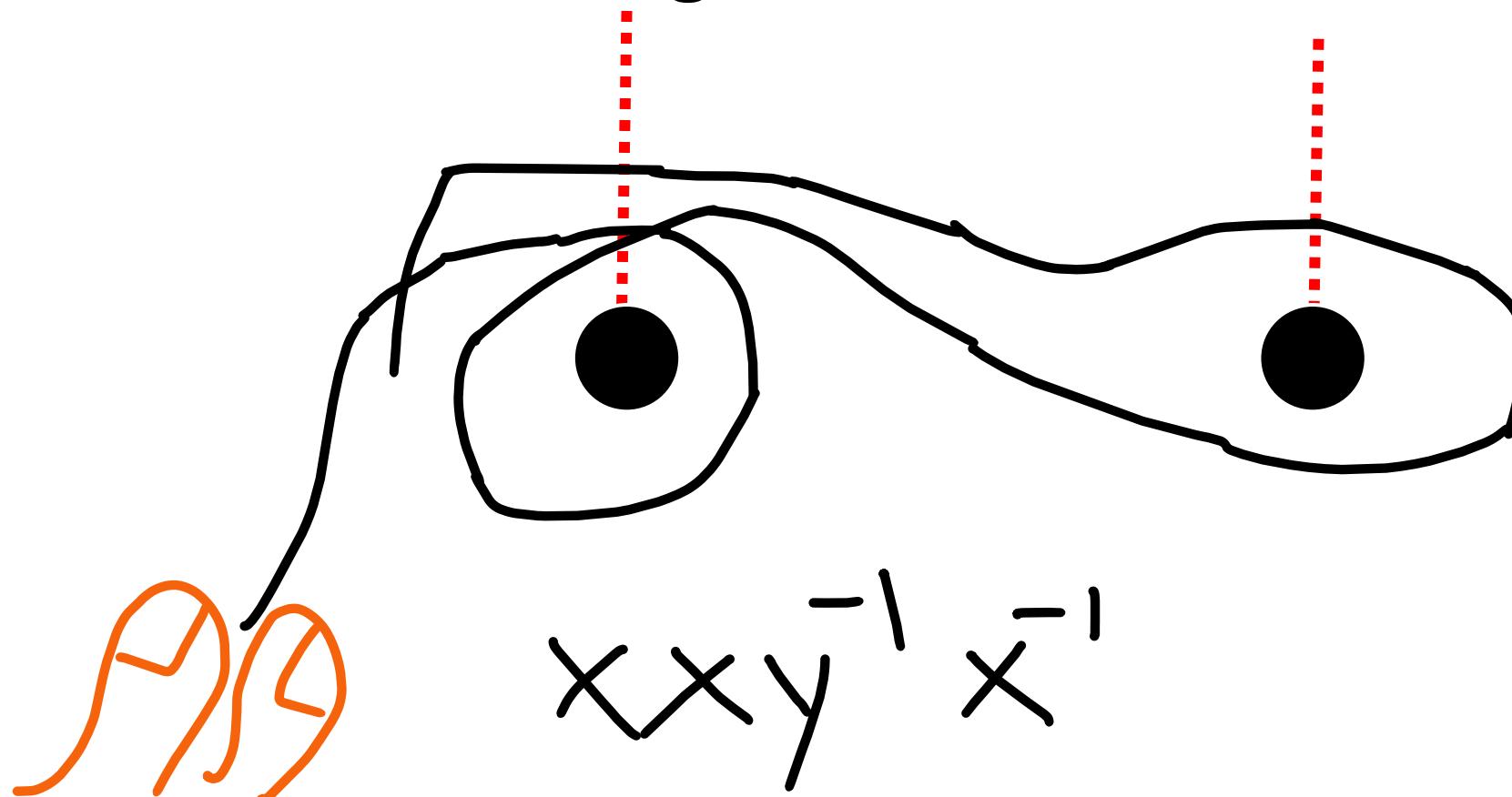


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

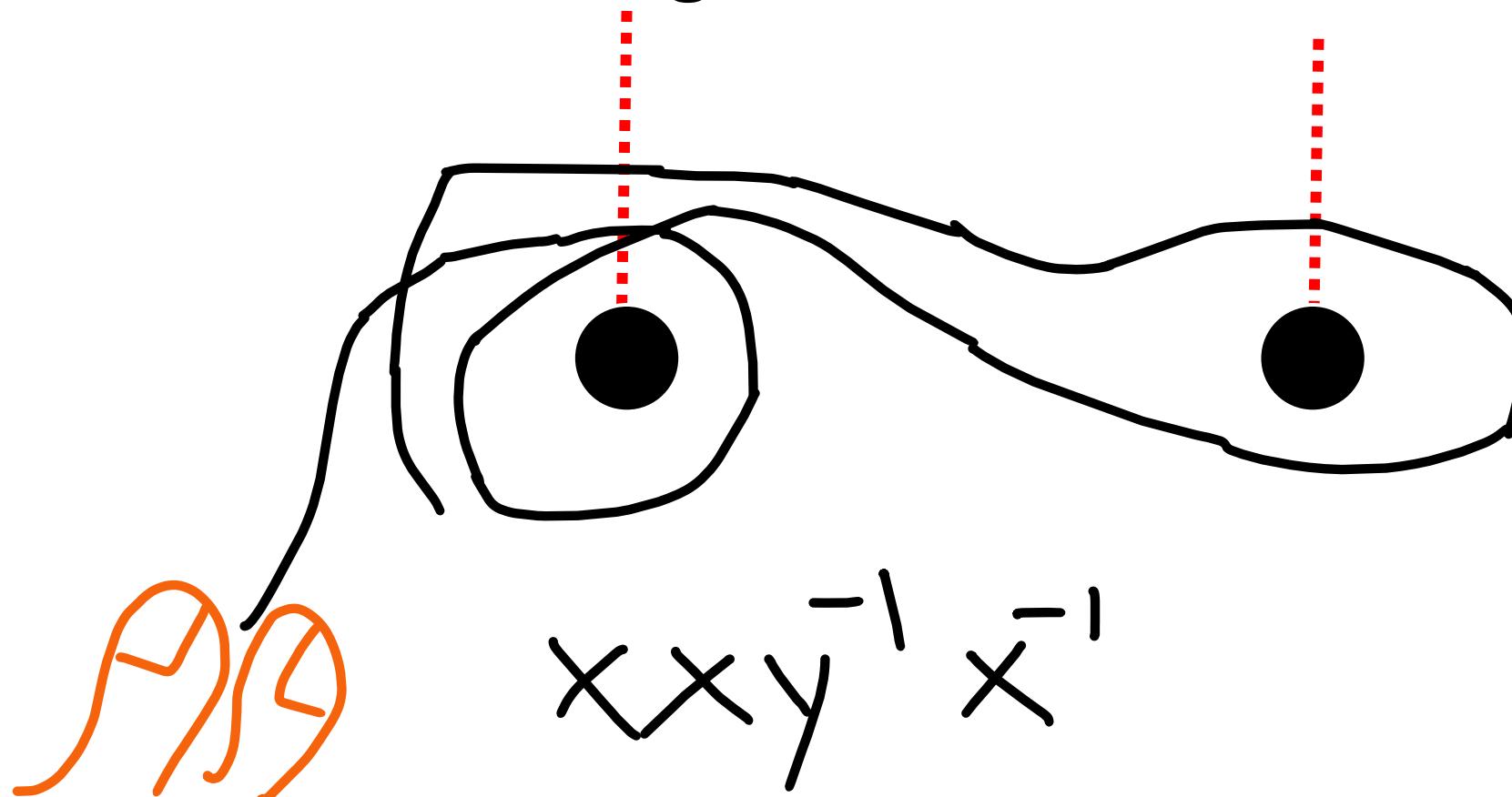


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

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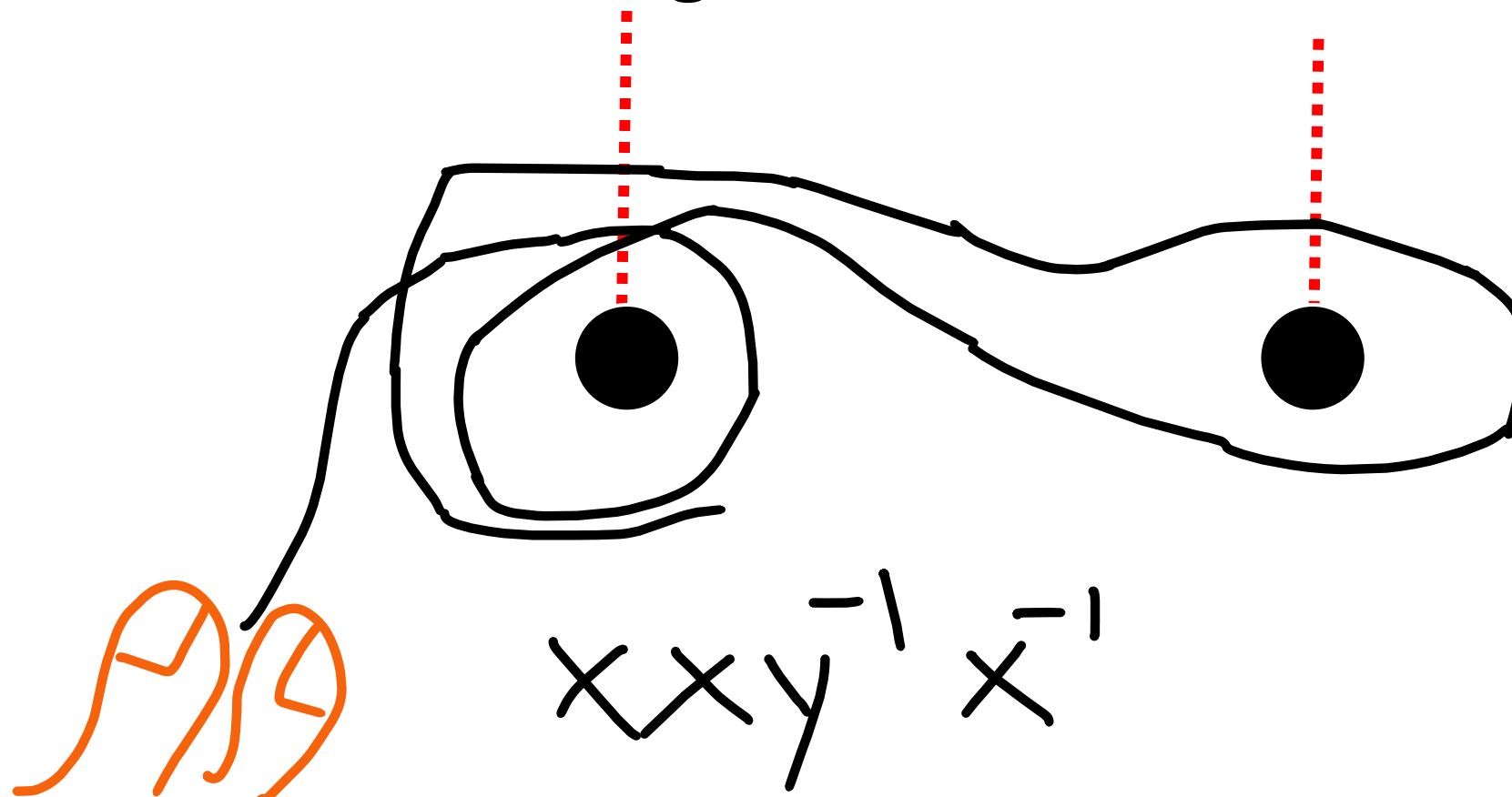


Cross over left nail clockwise: write  $x$

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Cross over right nail clockwise: write  $y$

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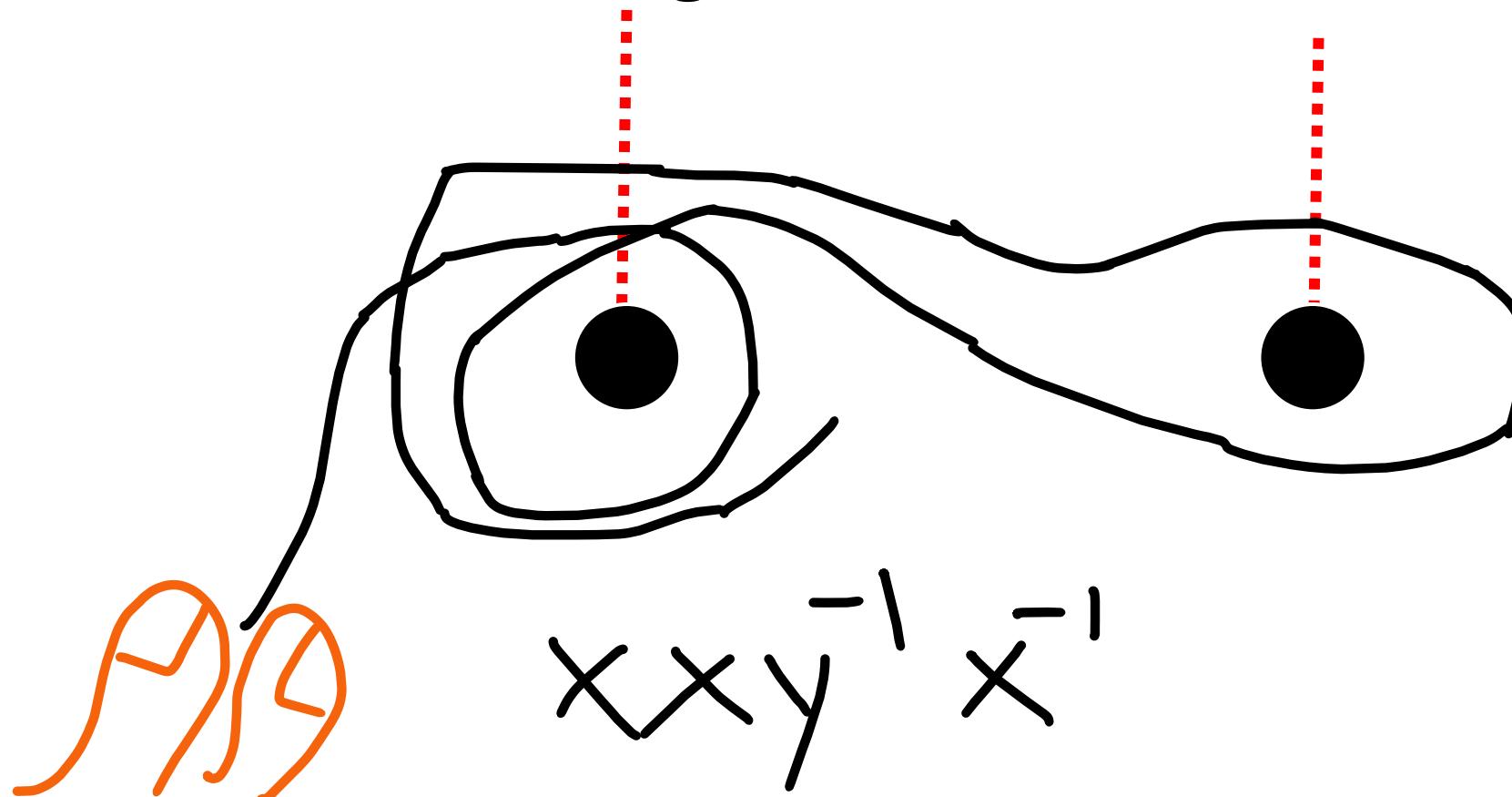


Cross over left nail clockwise: write  $x$

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Cross over right nail clockwise: write  $y$

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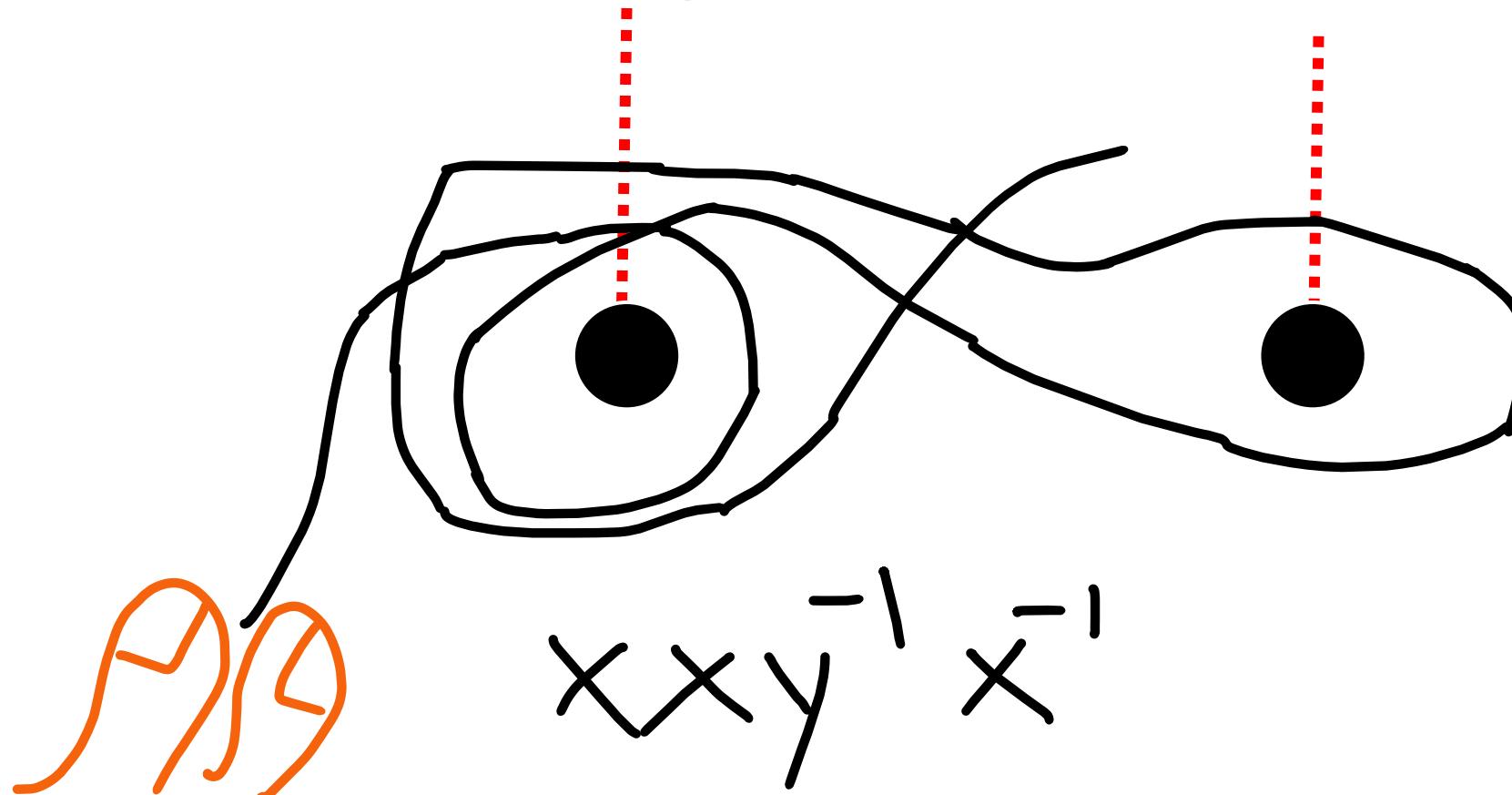


Cross over left nail clockwise: write  $x$

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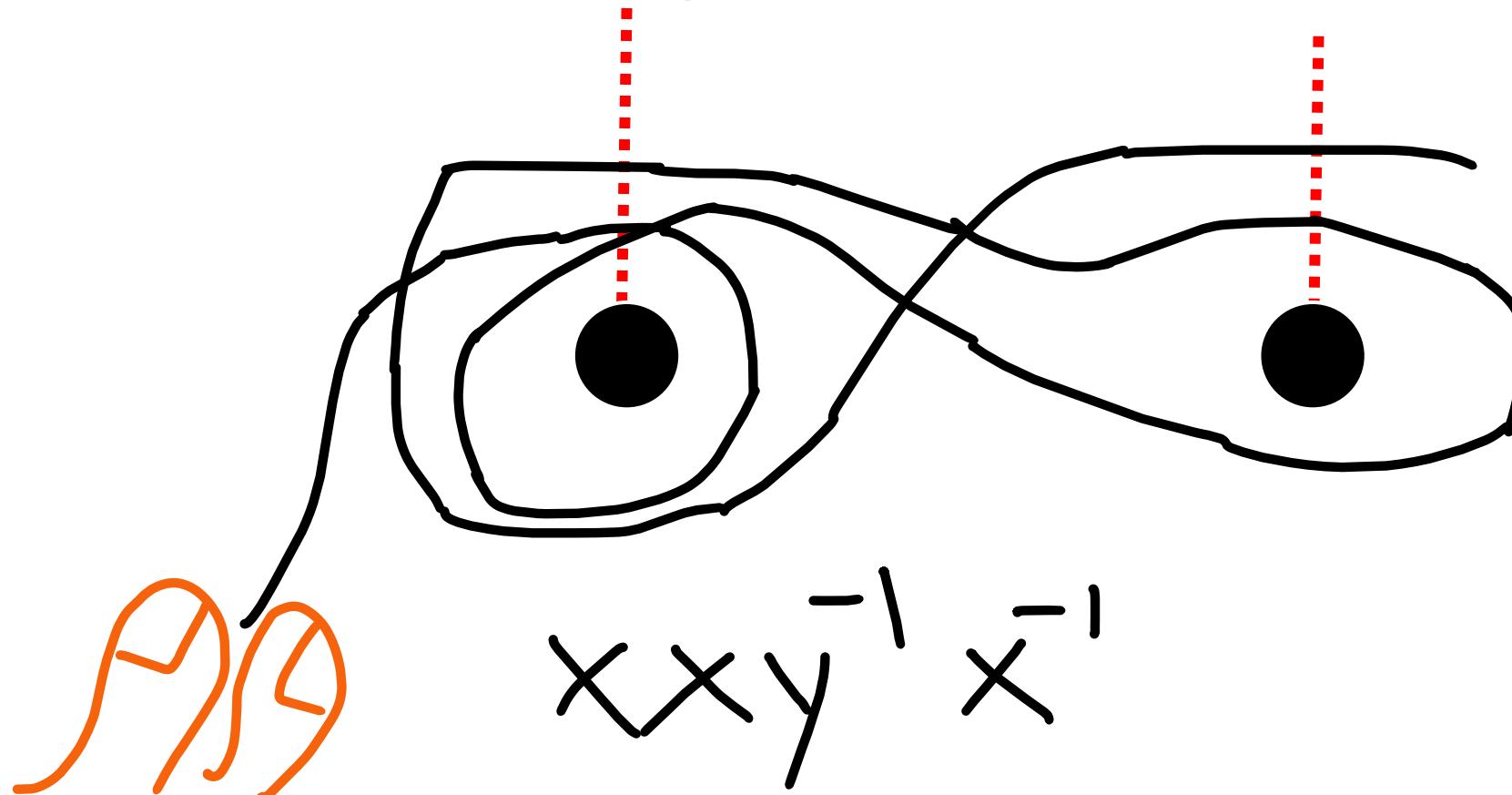


Cross over left nail clockwise: write  $x$

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Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

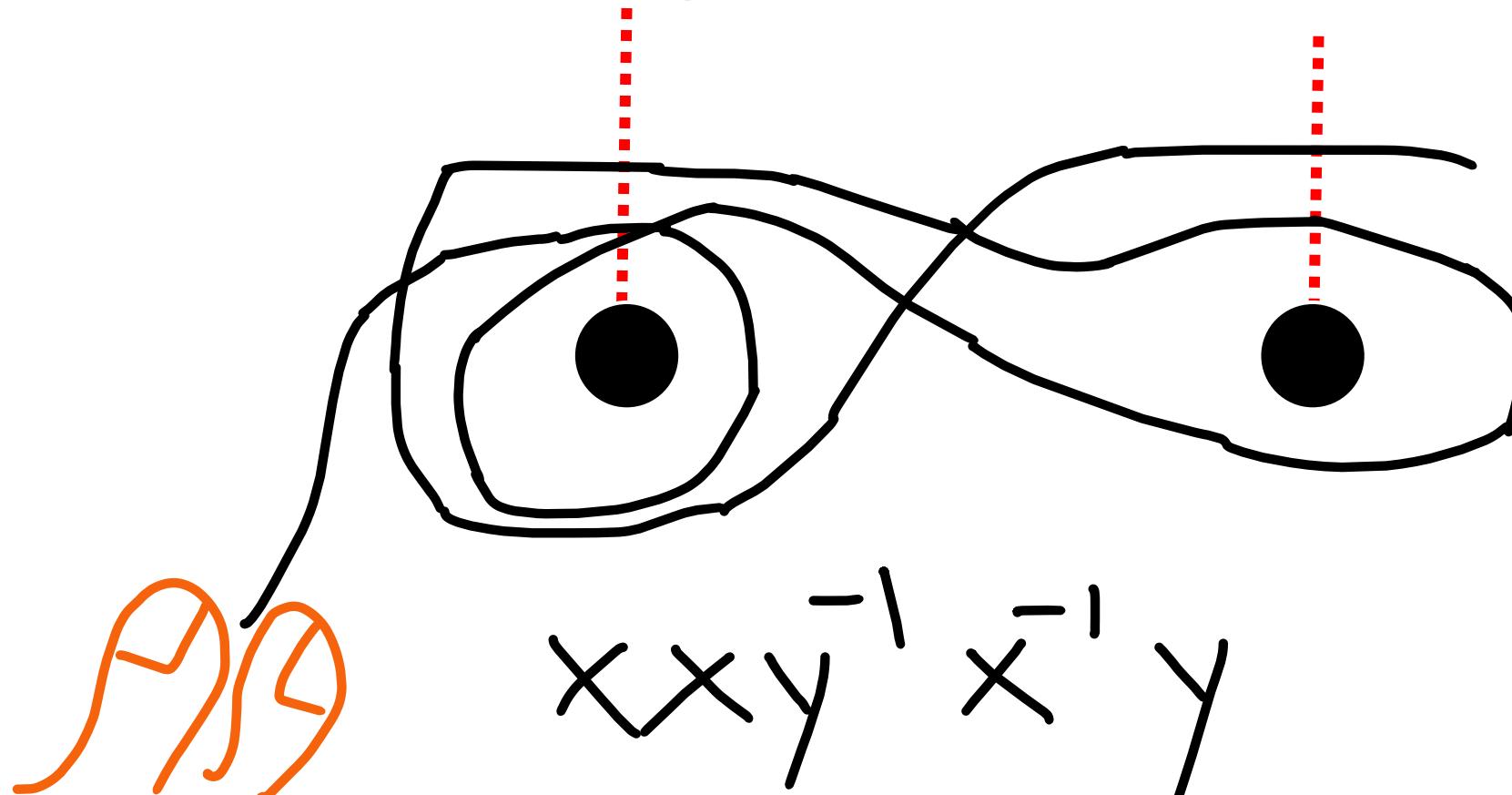


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

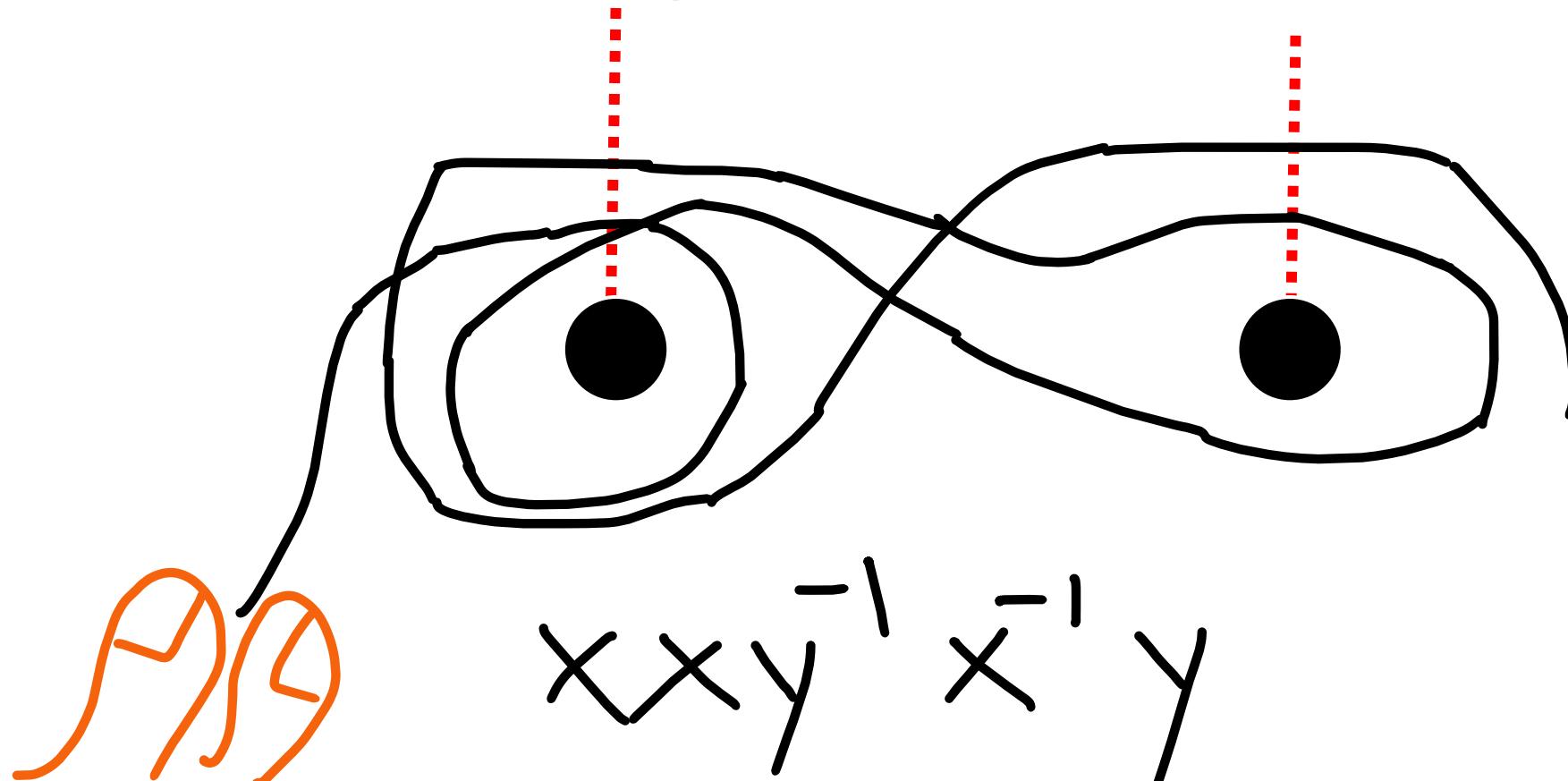


Cross over left nail clockwise: write  $x$

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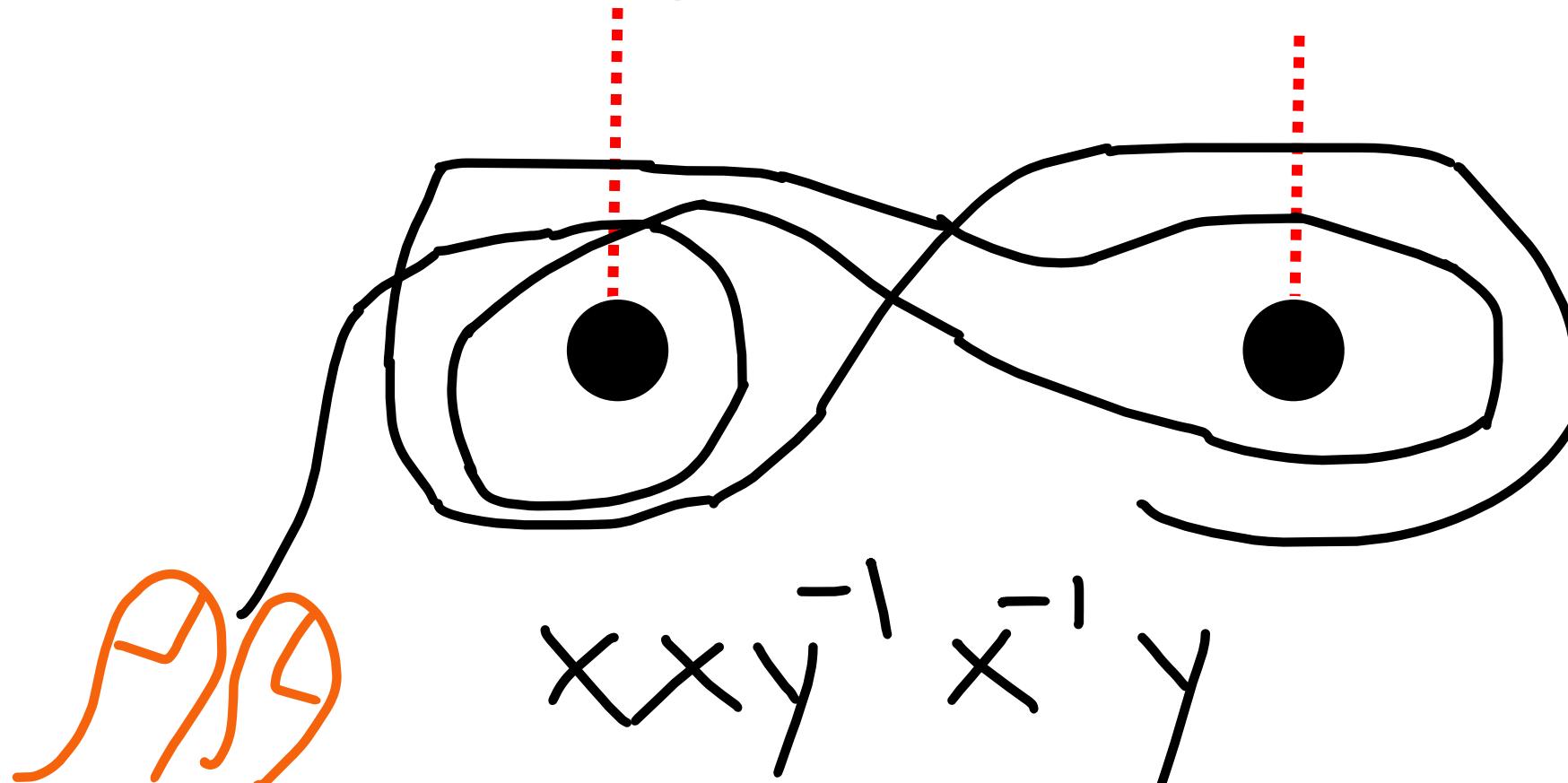


Cross over left nail clockwise: write  $x$

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Cross over right nail clockwise: write  $y$

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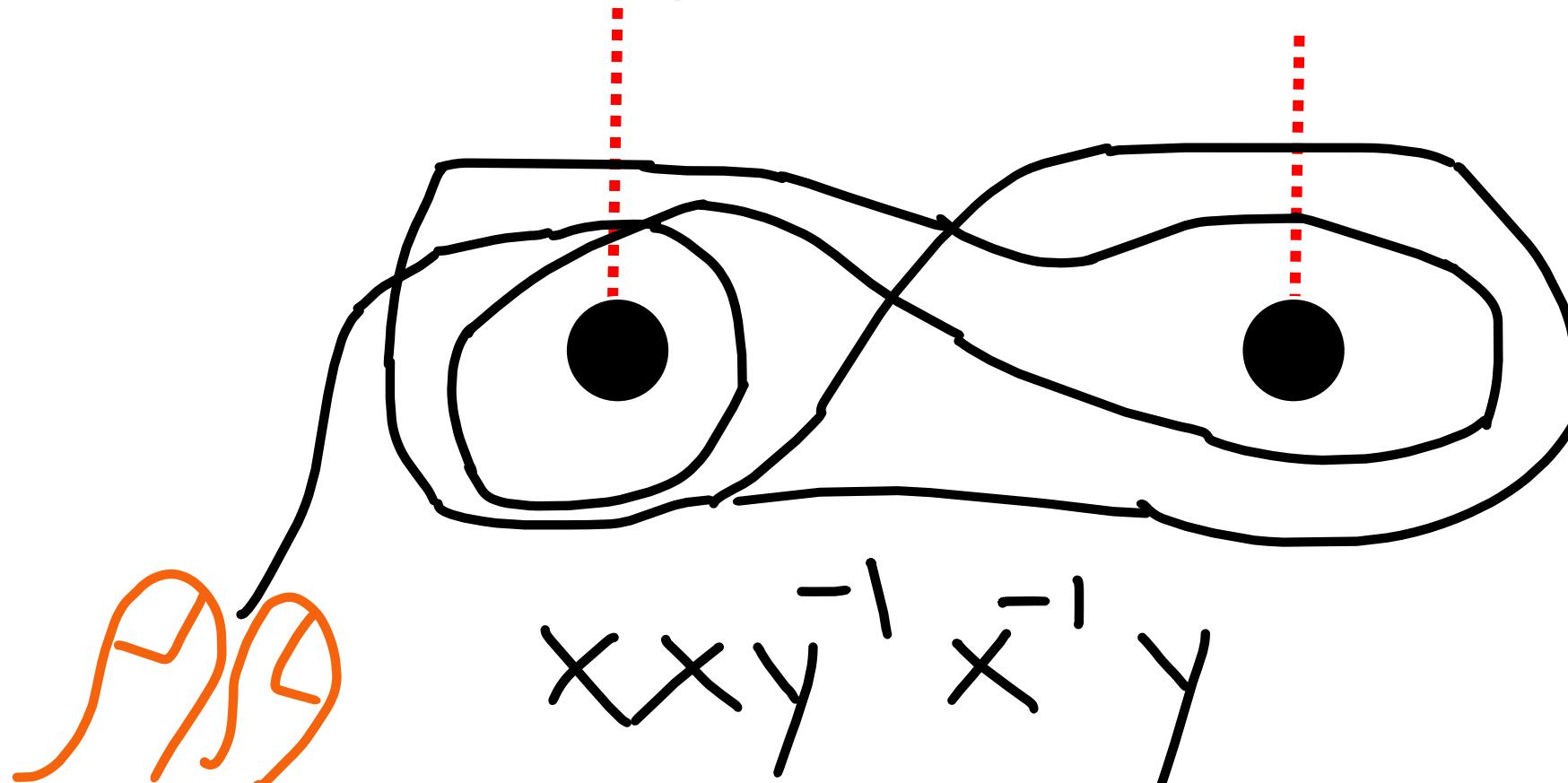


Cross over left nail clockwise: write  $x$

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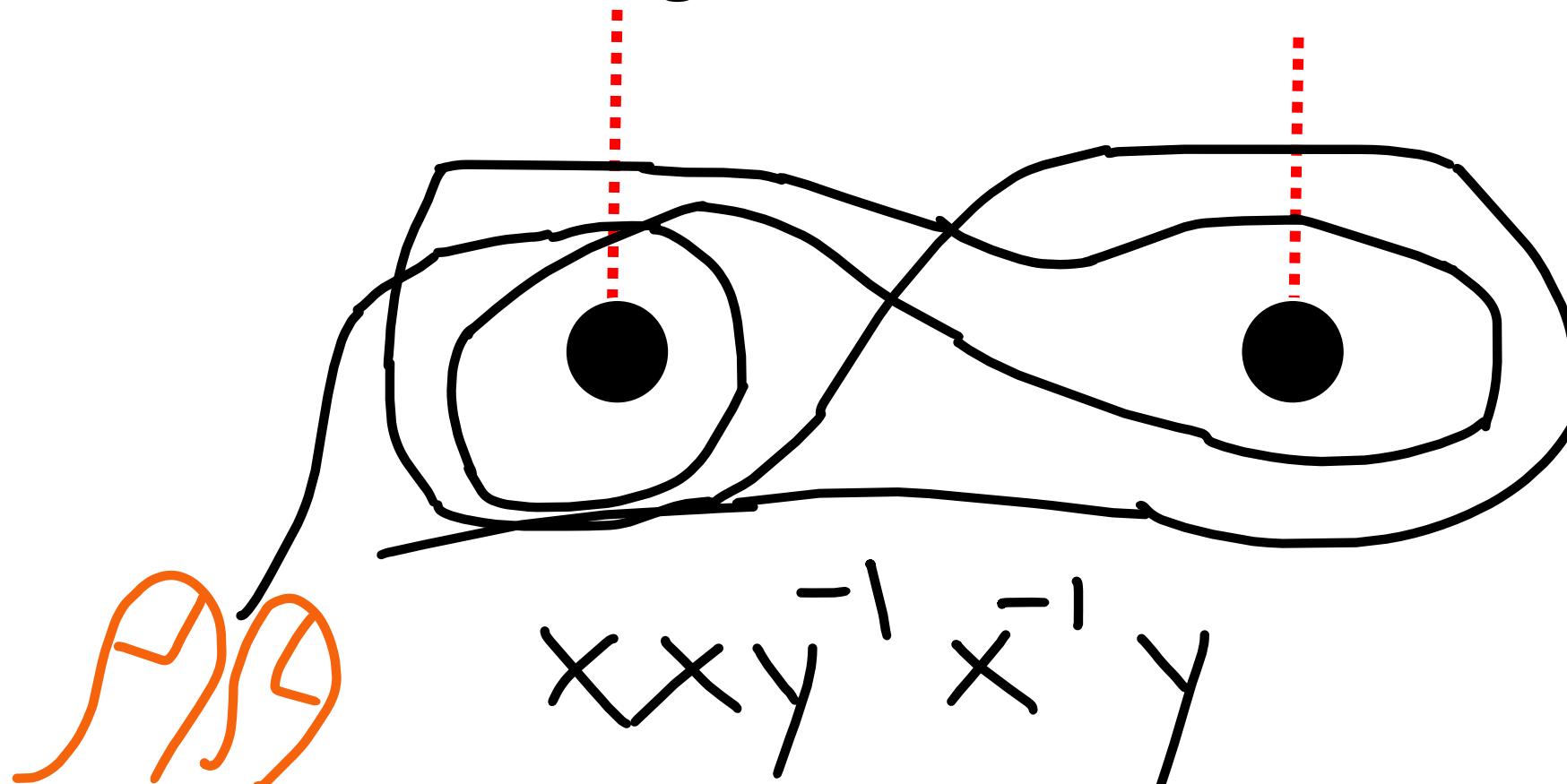


Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$



Cross over left nail clockwise: write  $x$

Cross over left nail counterclockwise: write  $x^{-1}$

Cross over right nail clockwise: write  $y$

Cross over right nail counterclockwise : write  $y^{-1}$

