

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}

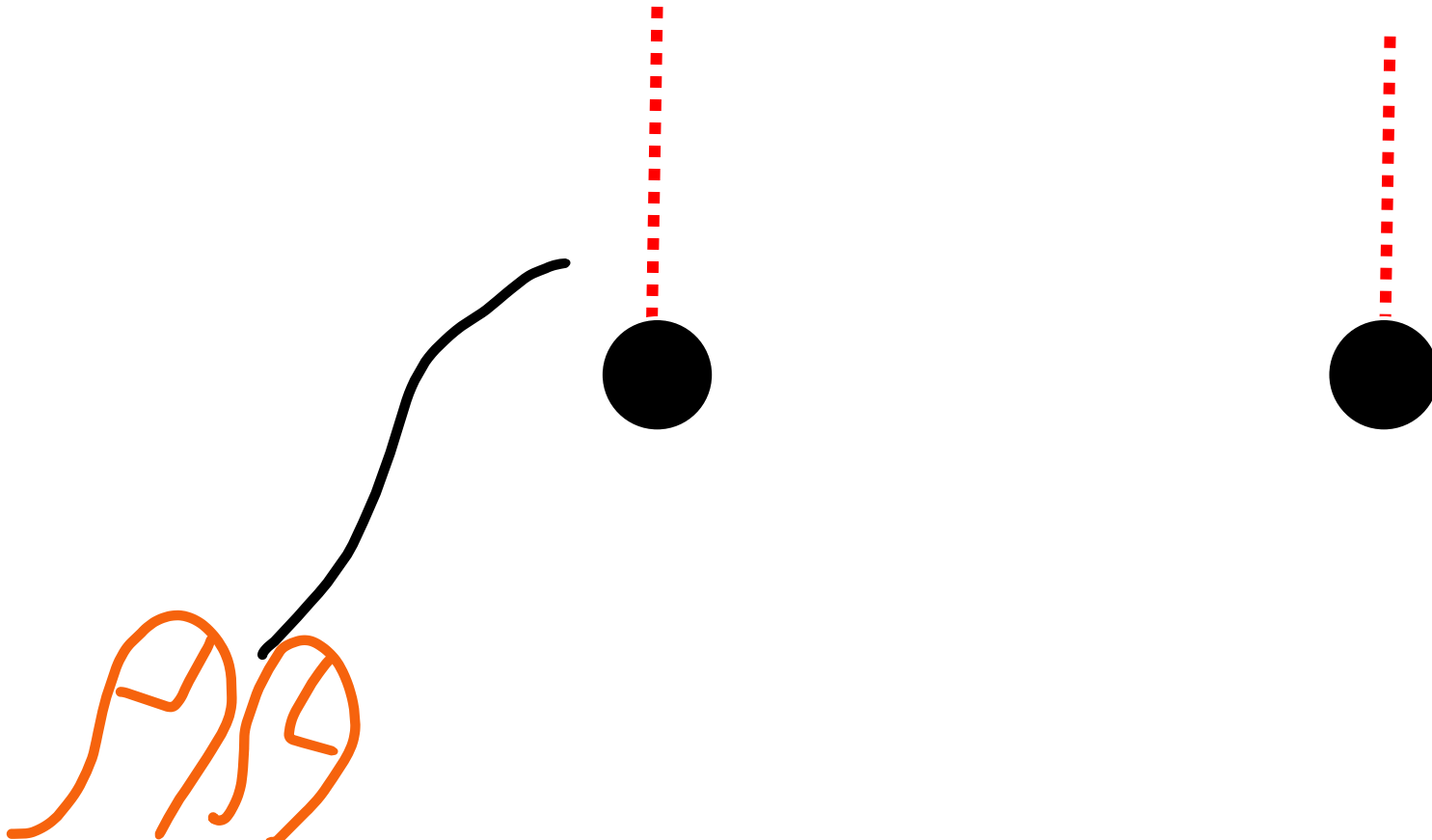


Cross over left nail clockwise: write x

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

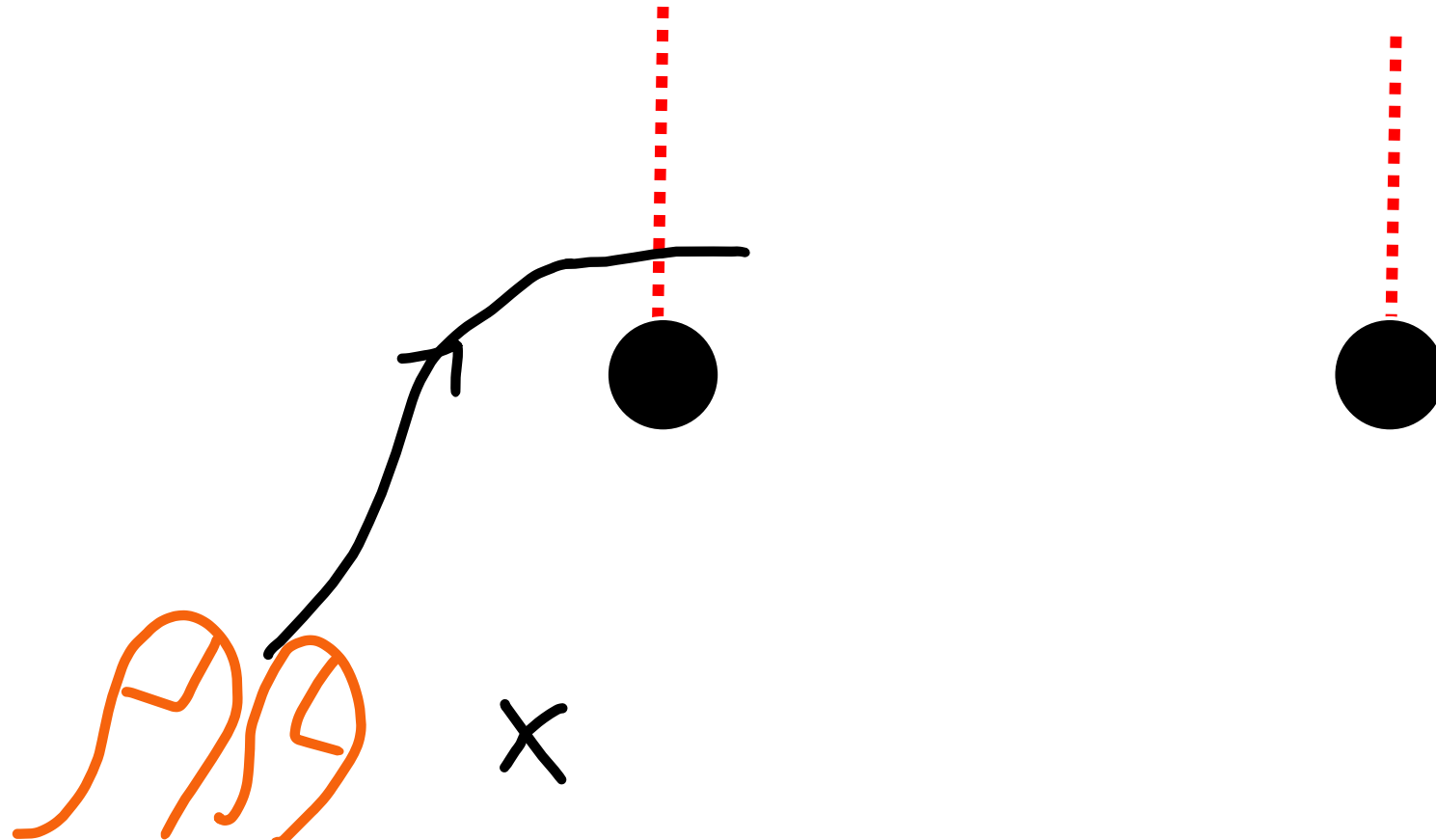


Cross over left nail clockwise: write x

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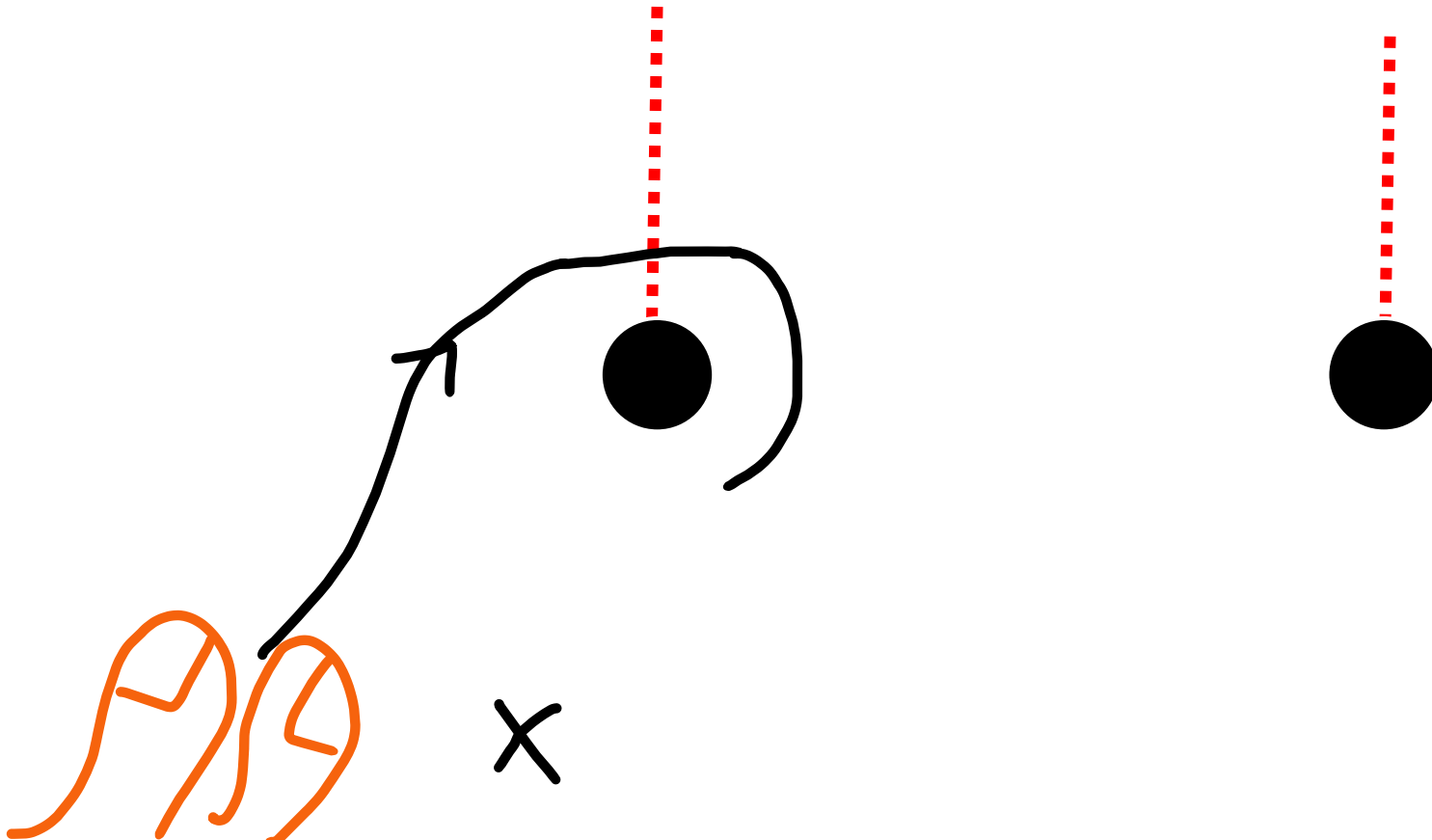


Cross over left nail clockwise: write x

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Cross over right nail clockwise: write y

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

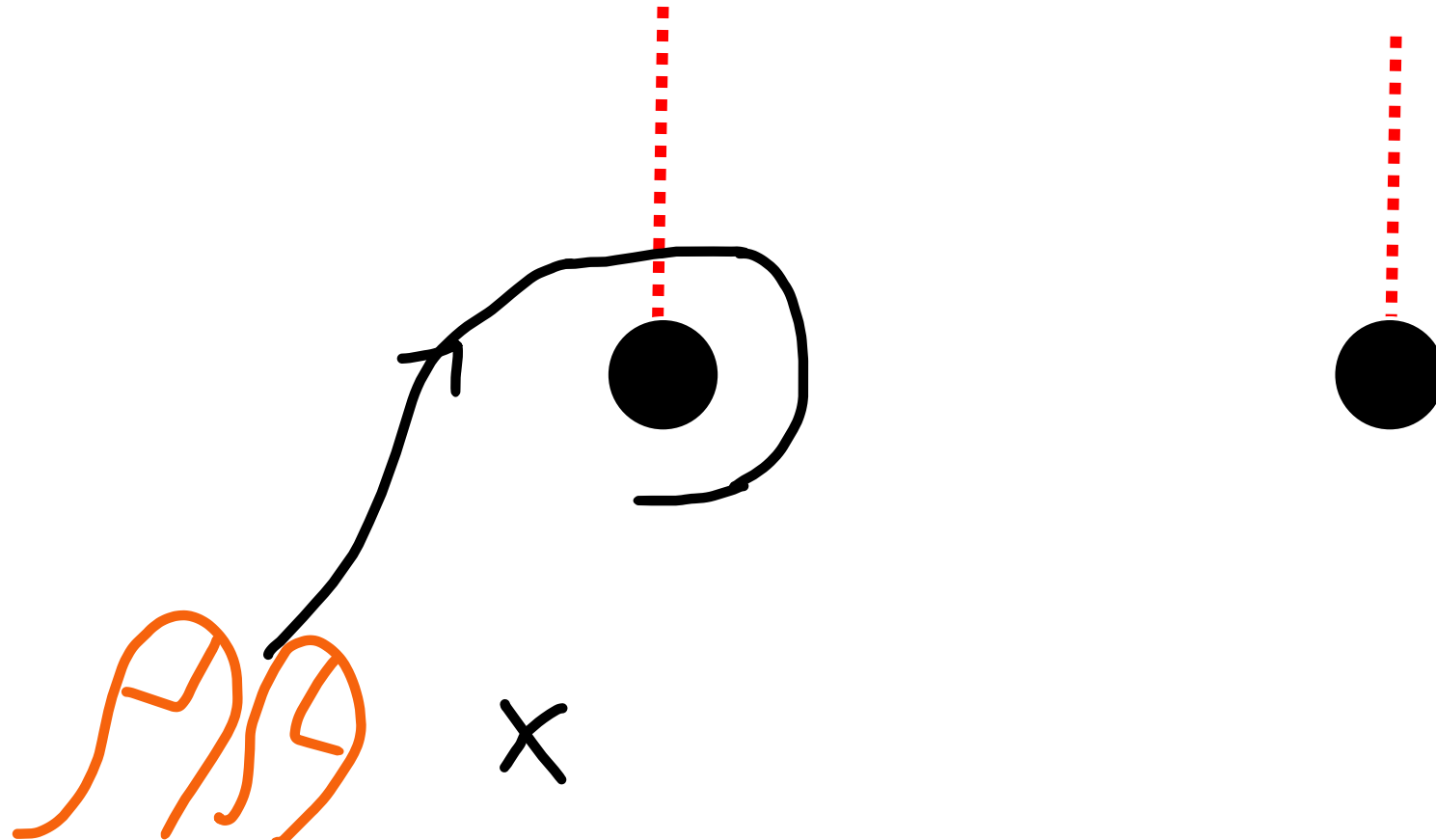


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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

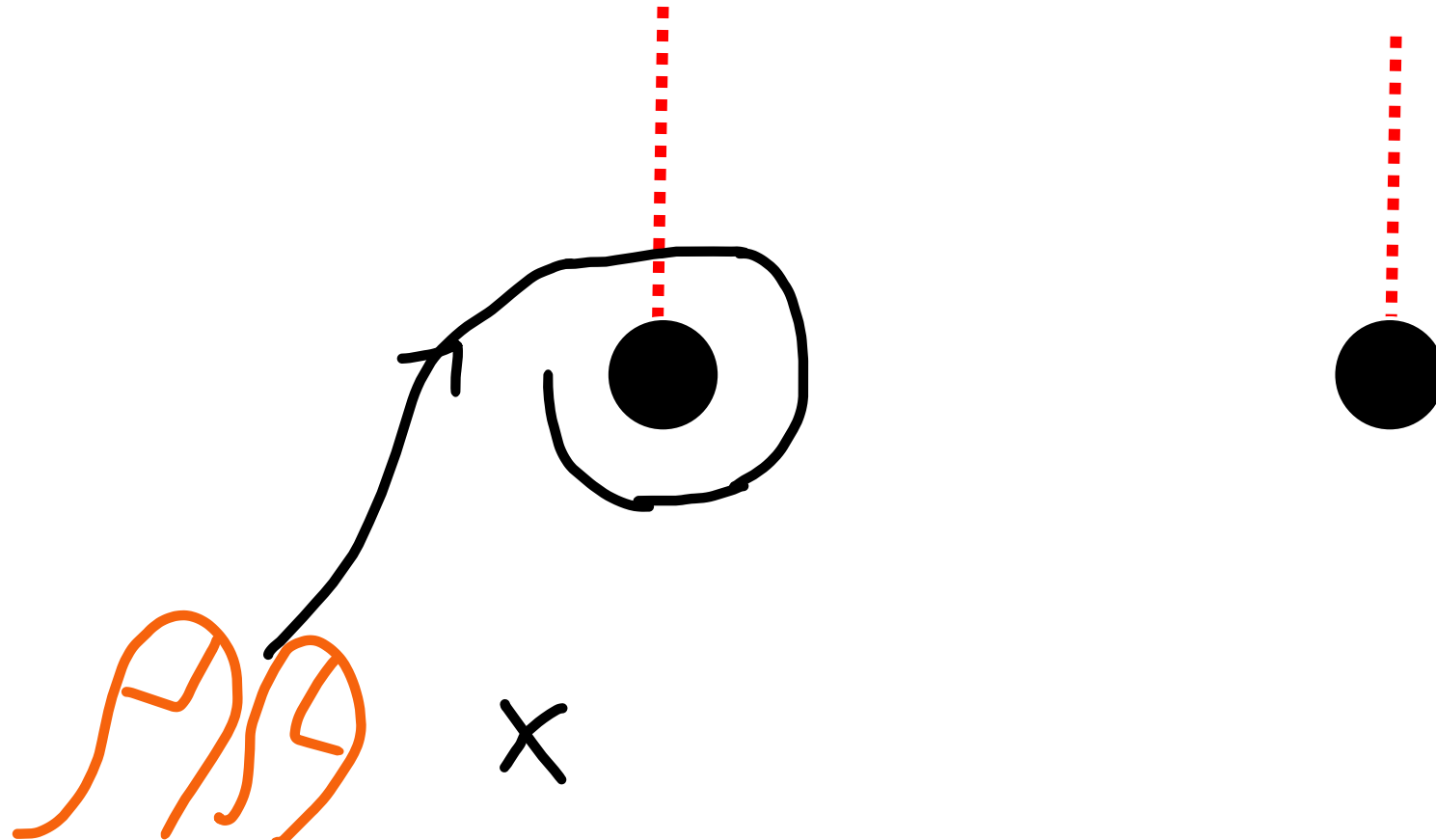


Cross over left nail clockwise: write x

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Cross over right nail clockwise: write y

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

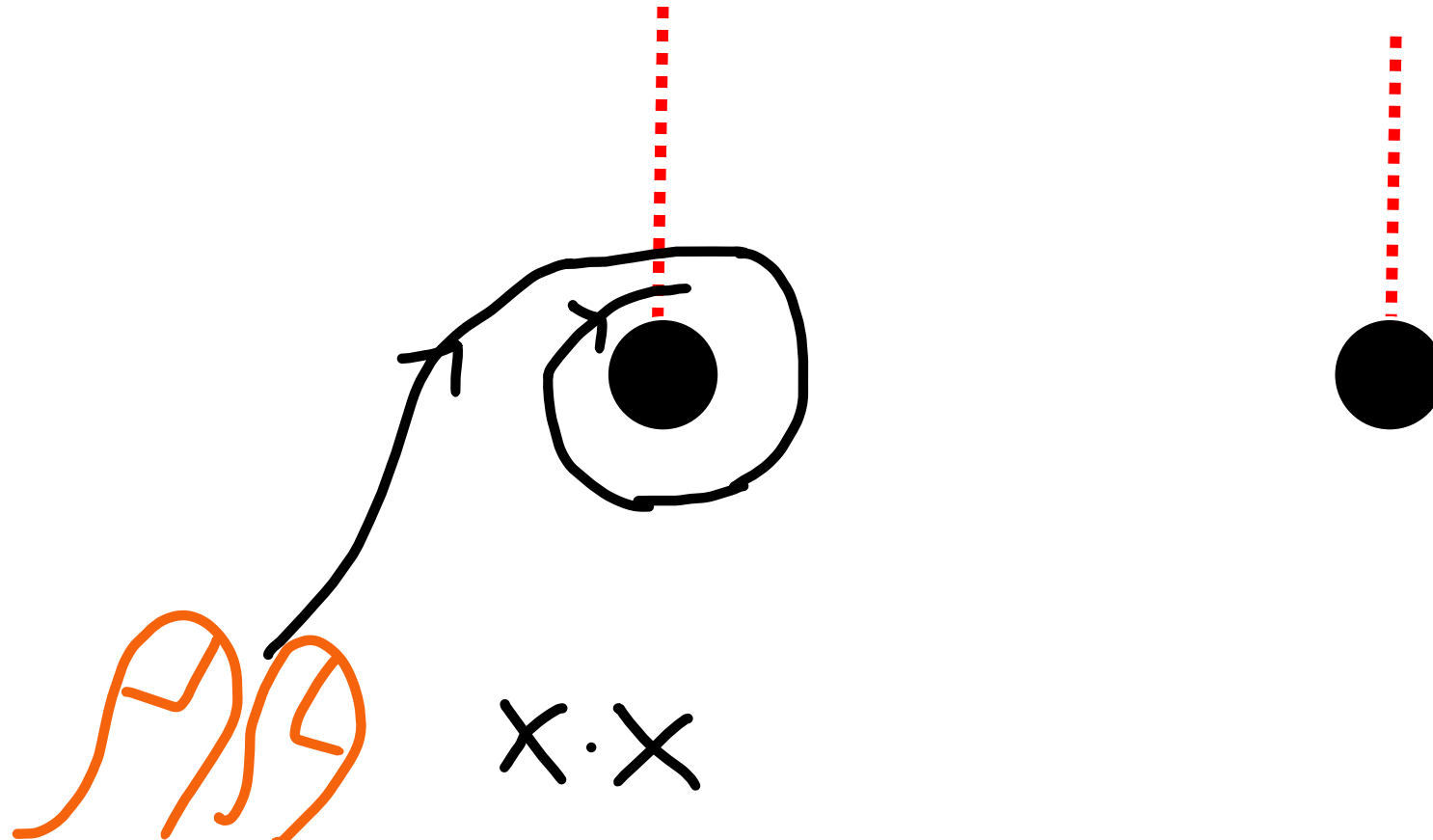


Cross over left nail clockwise: write x

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

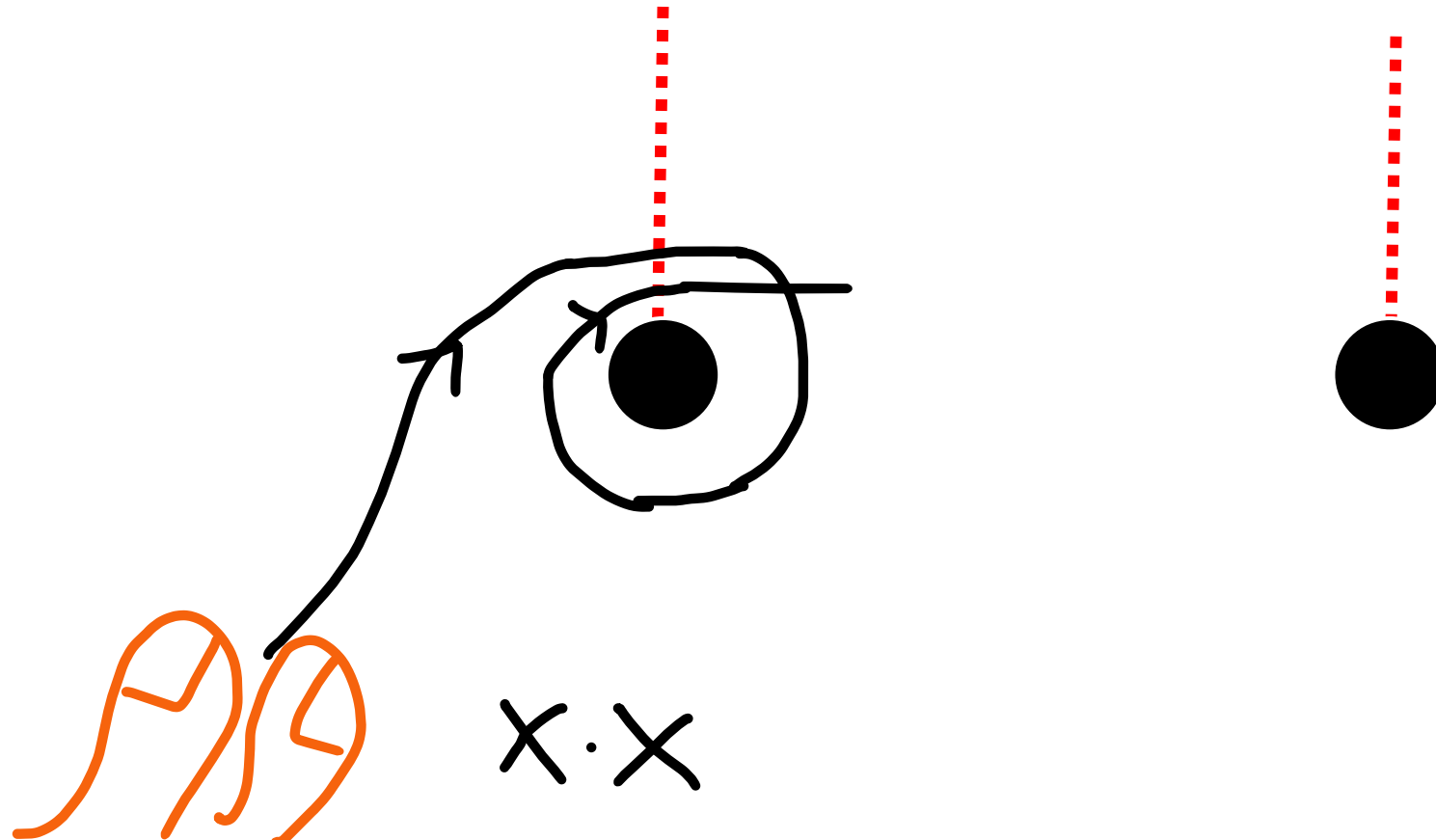


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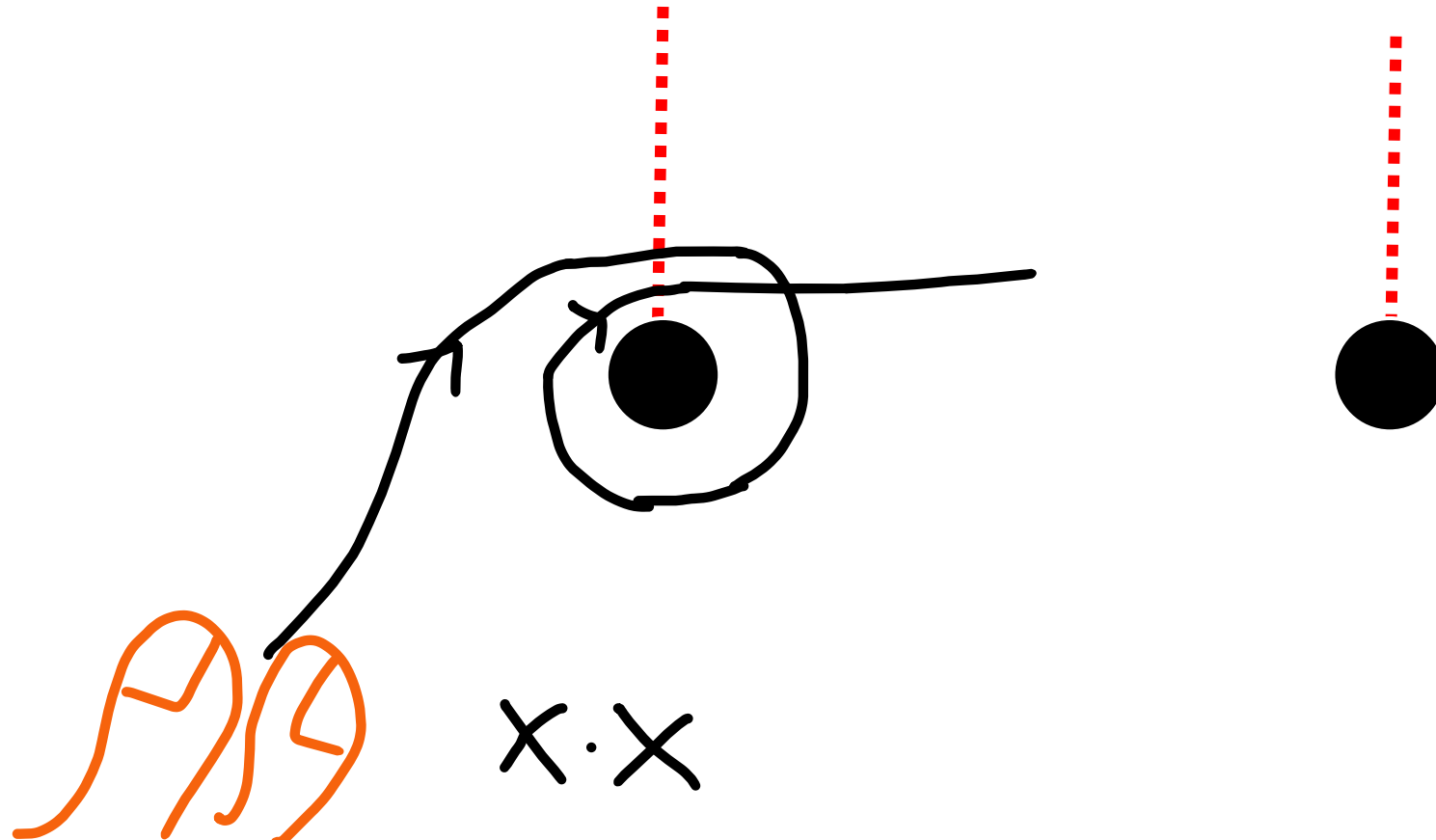


Cross over left nail clockwise: write x

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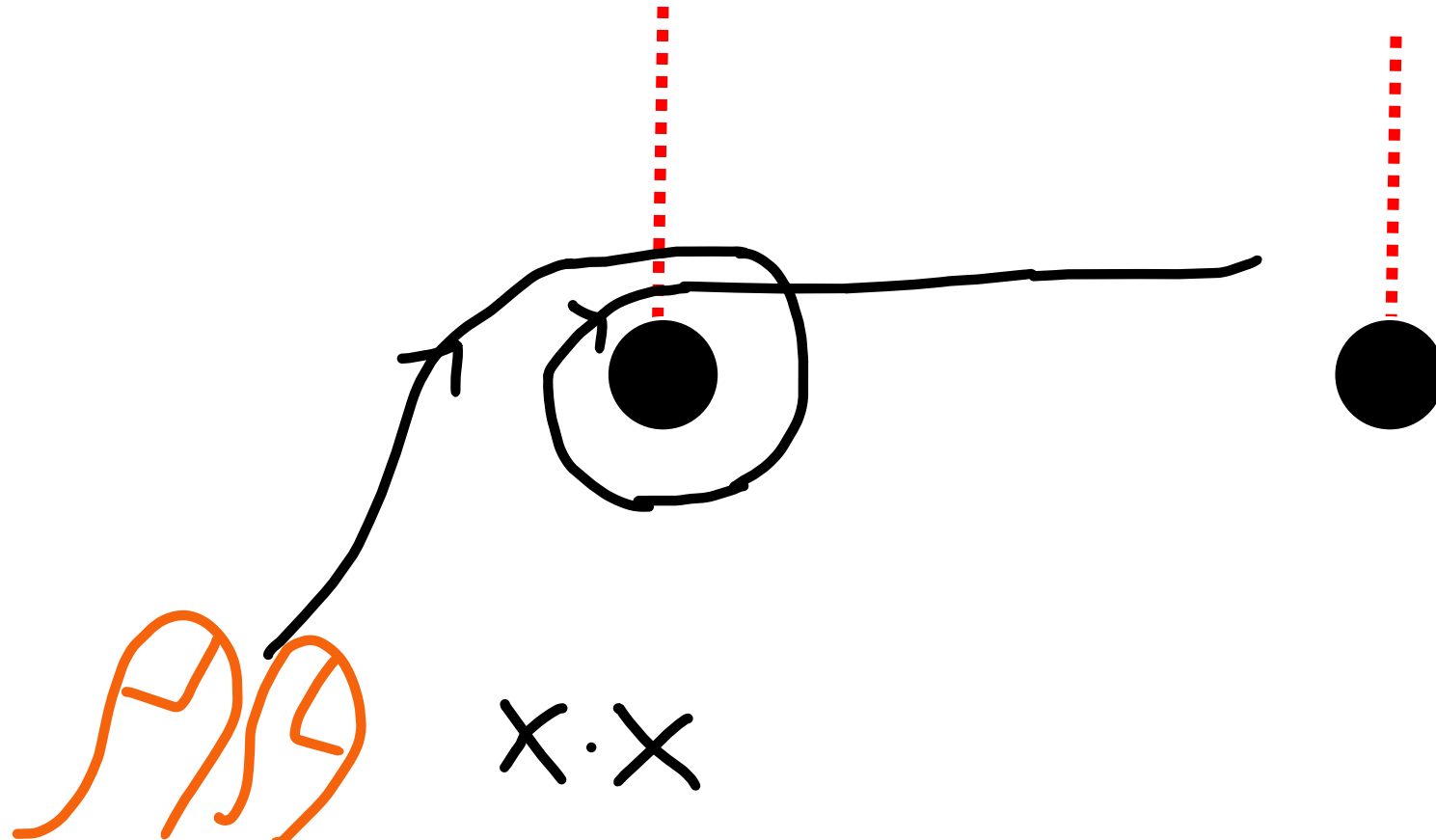


Cross over left nail clockwise: write x

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

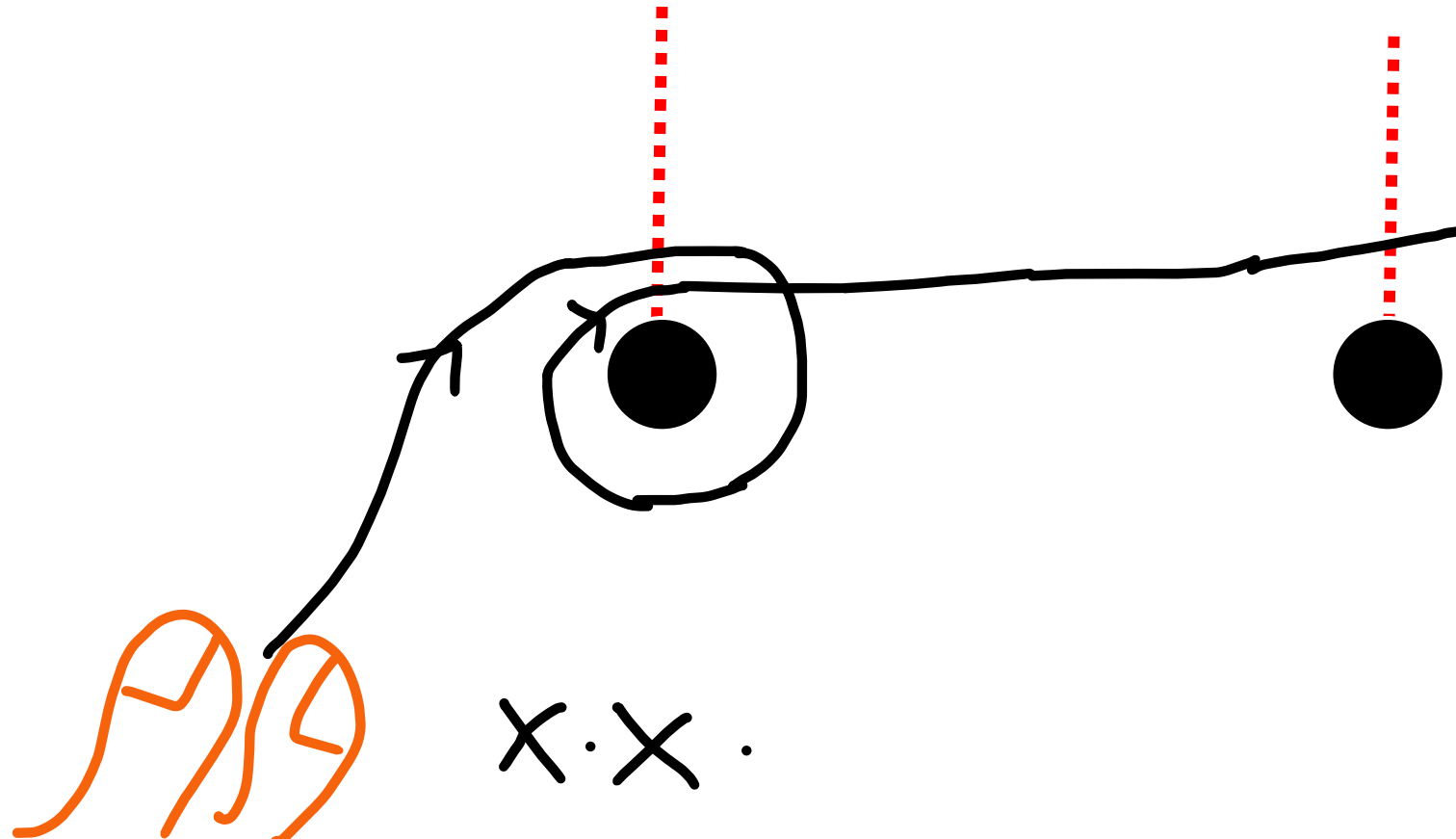


Cross over left nail clockwise: write x

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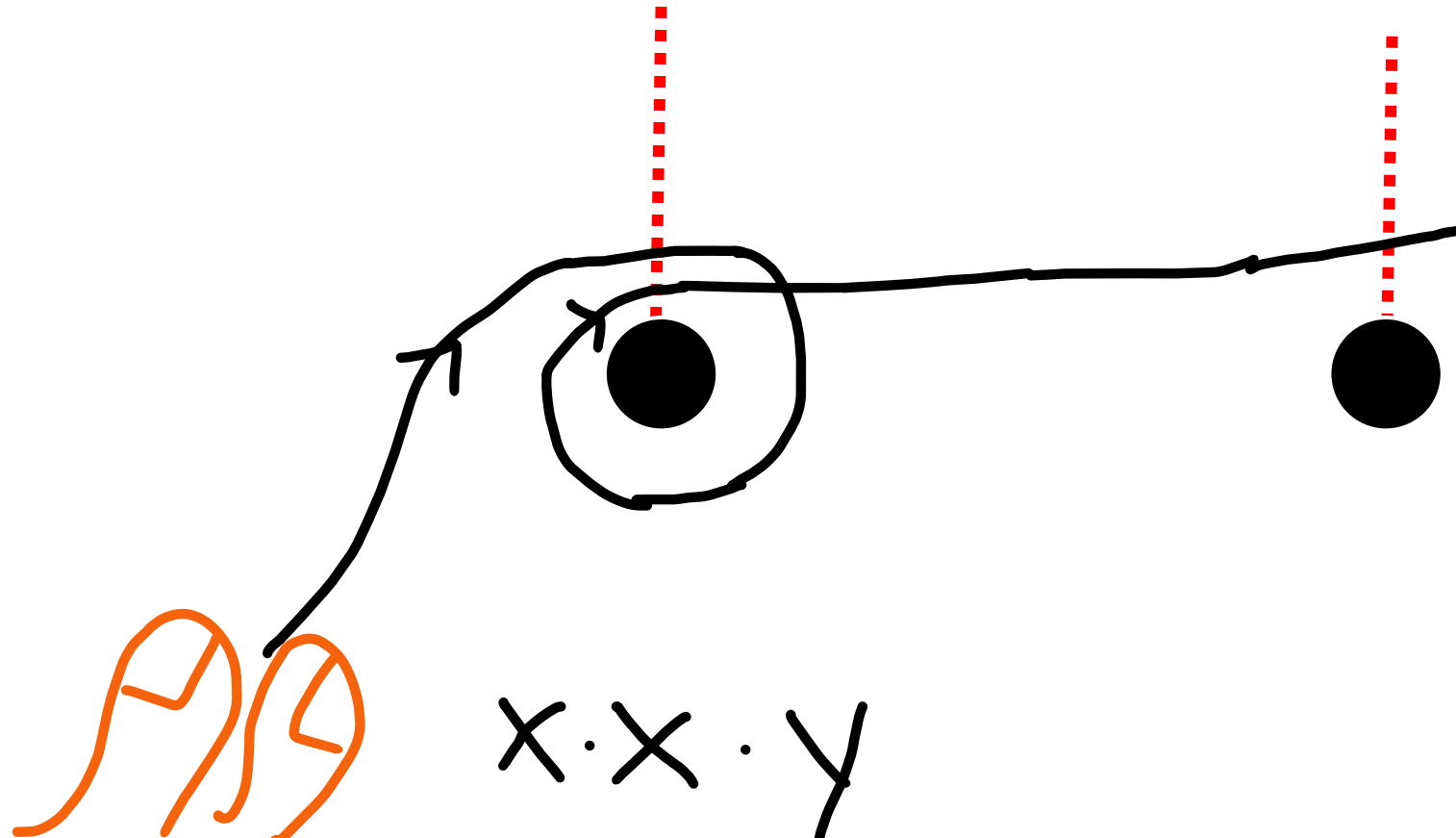


Cross over left nail clockwise: write x

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Cross over right nail clockwise: write y

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

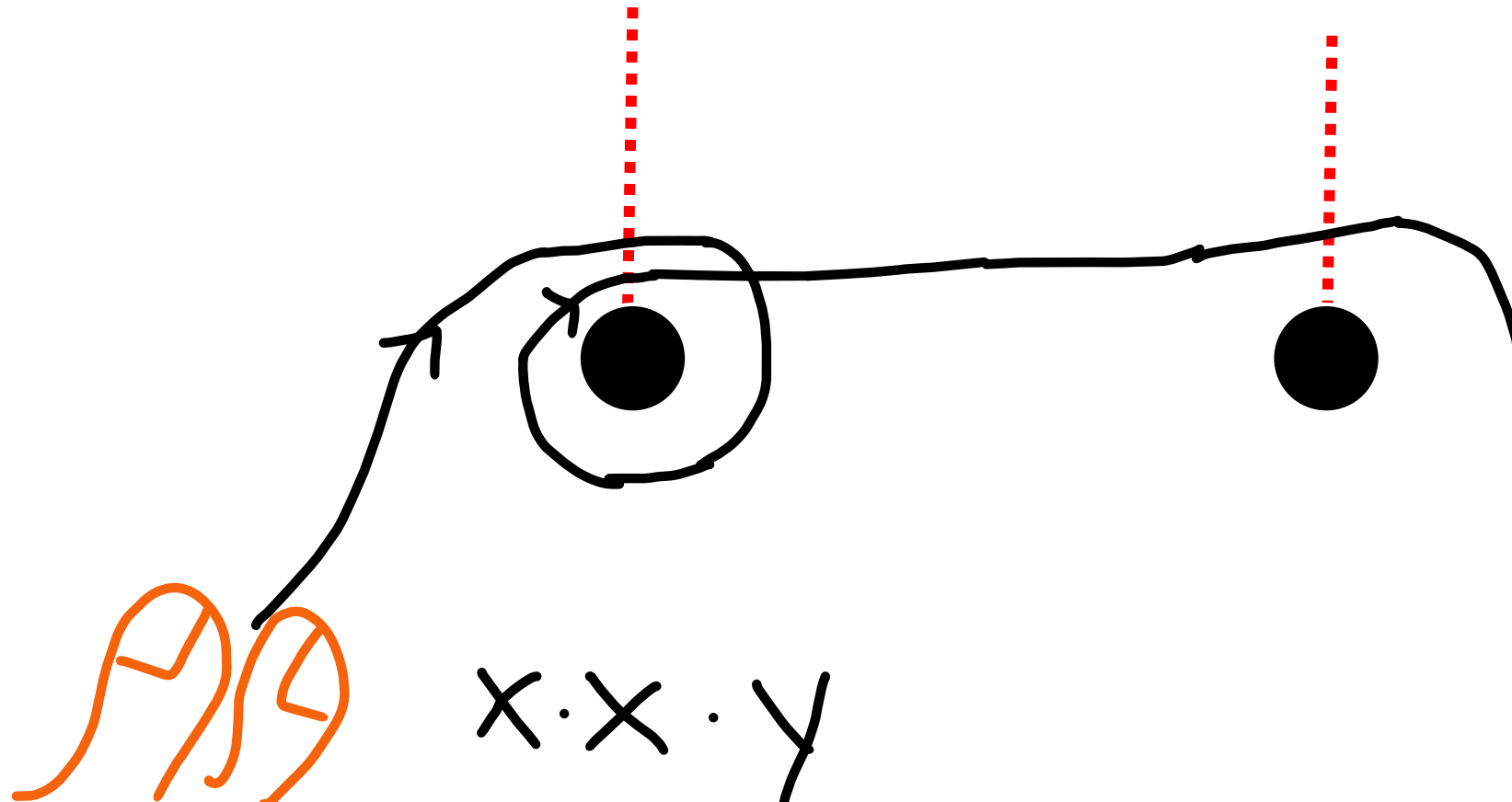


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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

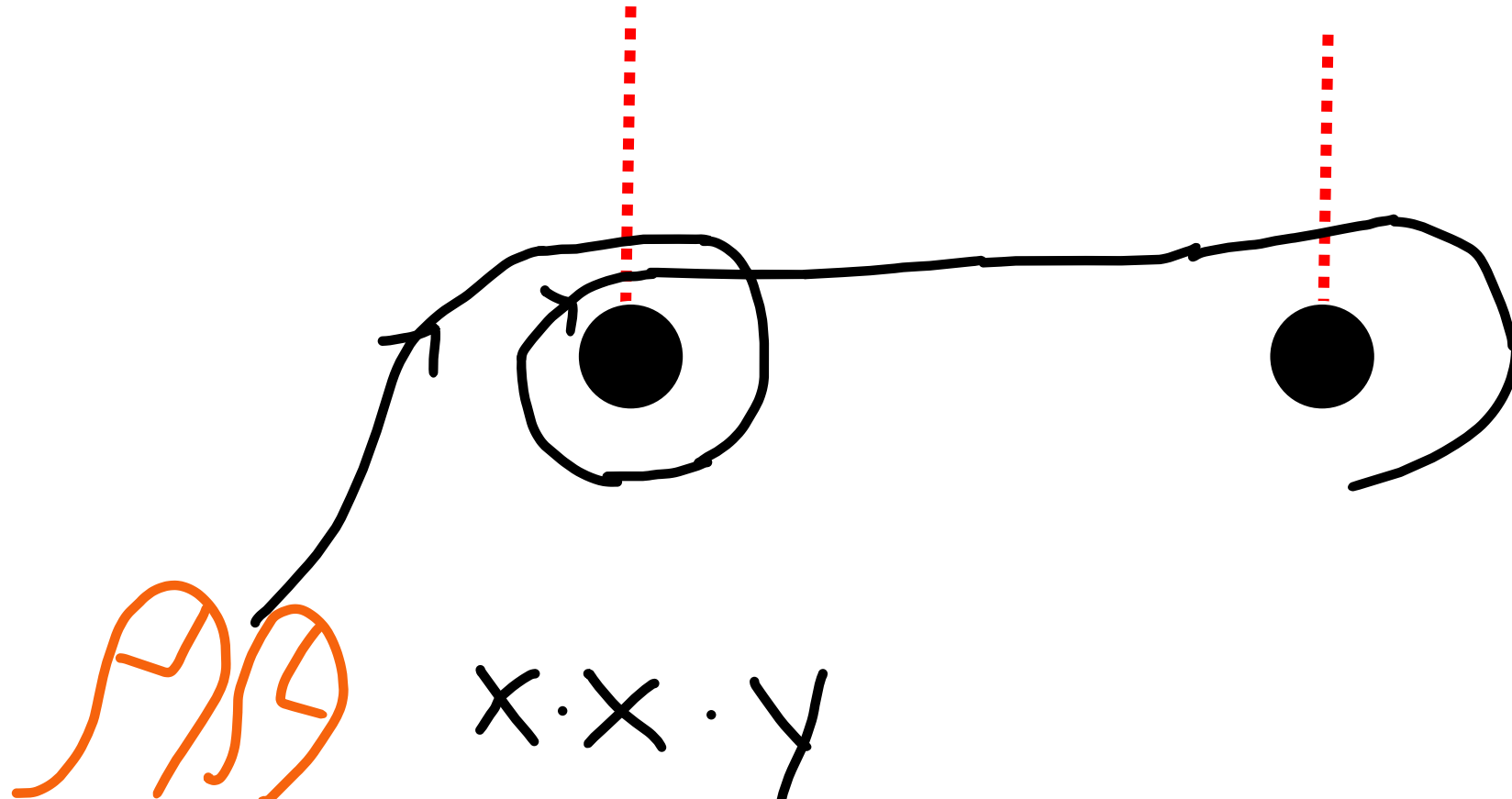


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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

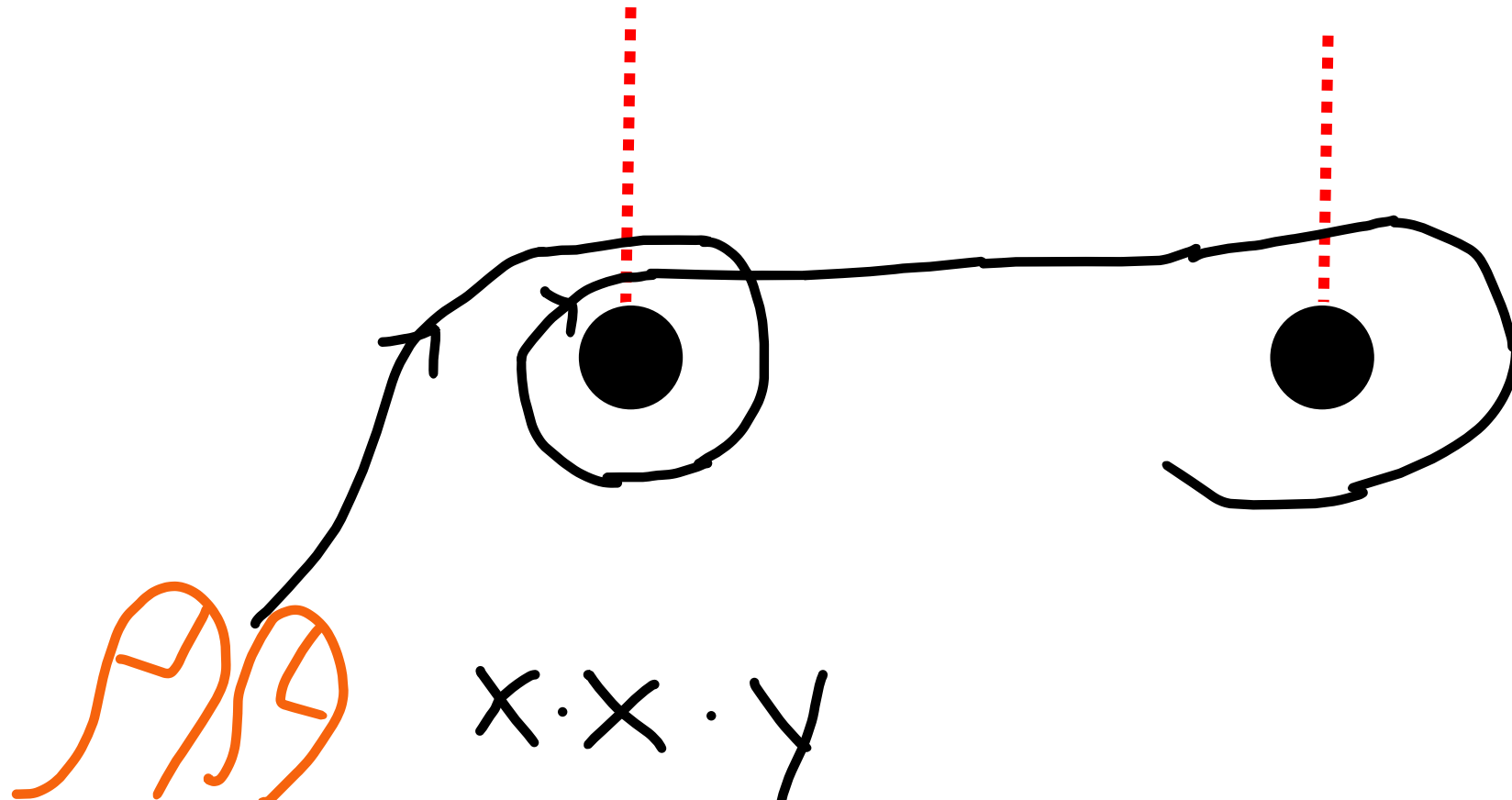


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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

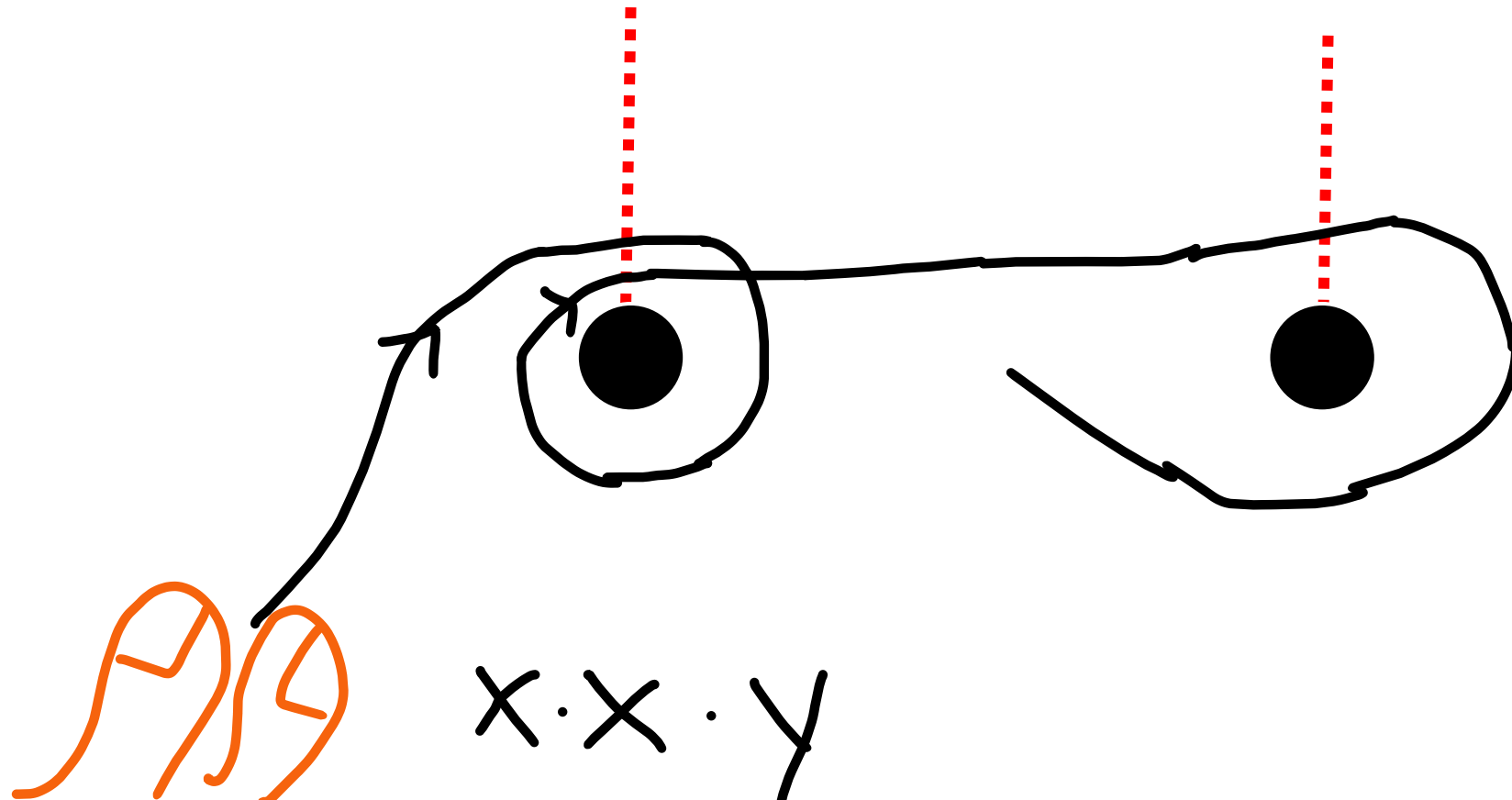


Cross over left nail clockwise: write x

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Cross over right nail clockwise: write y

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



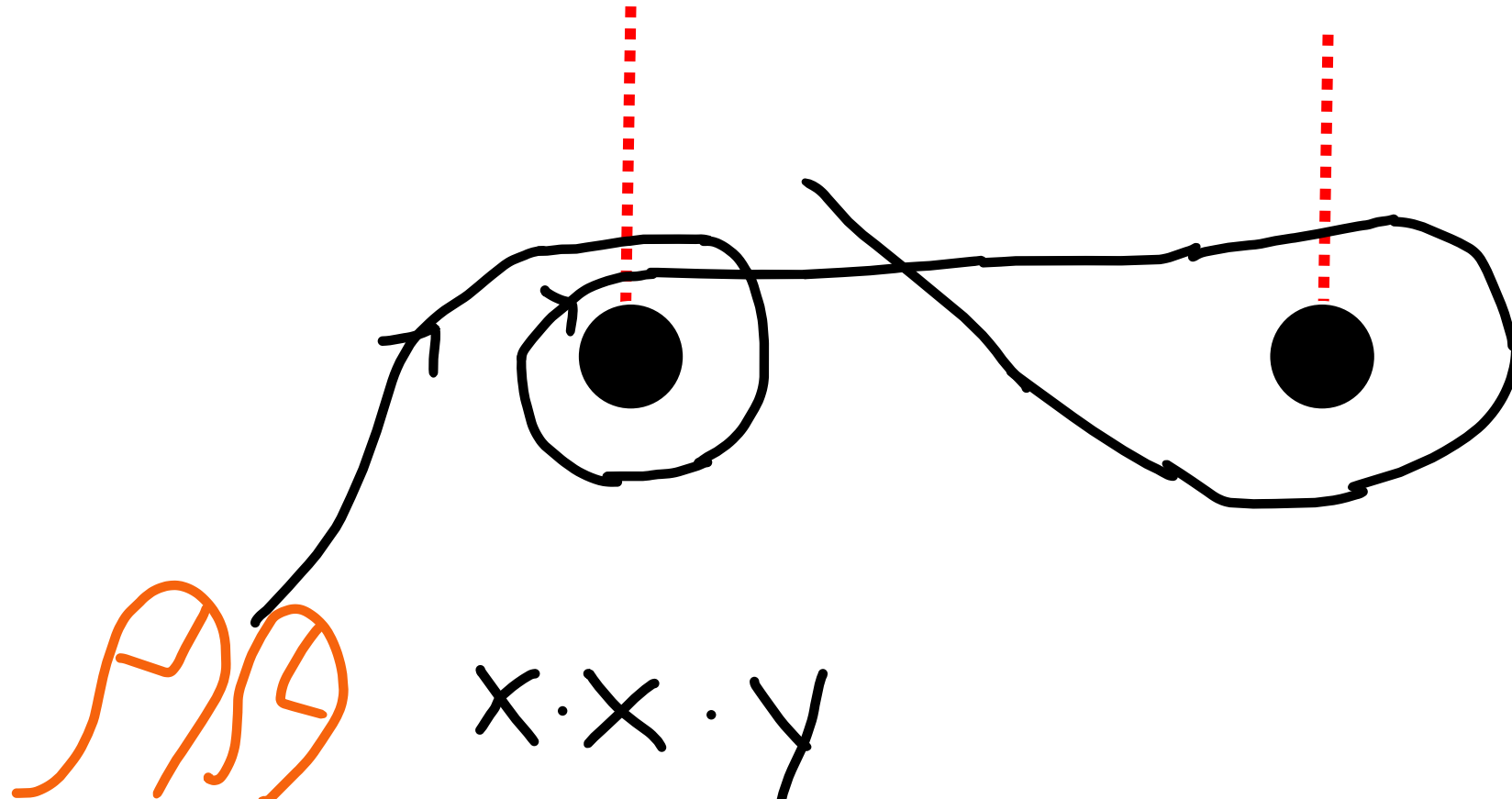
$x \cdot x \cdot y$

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}

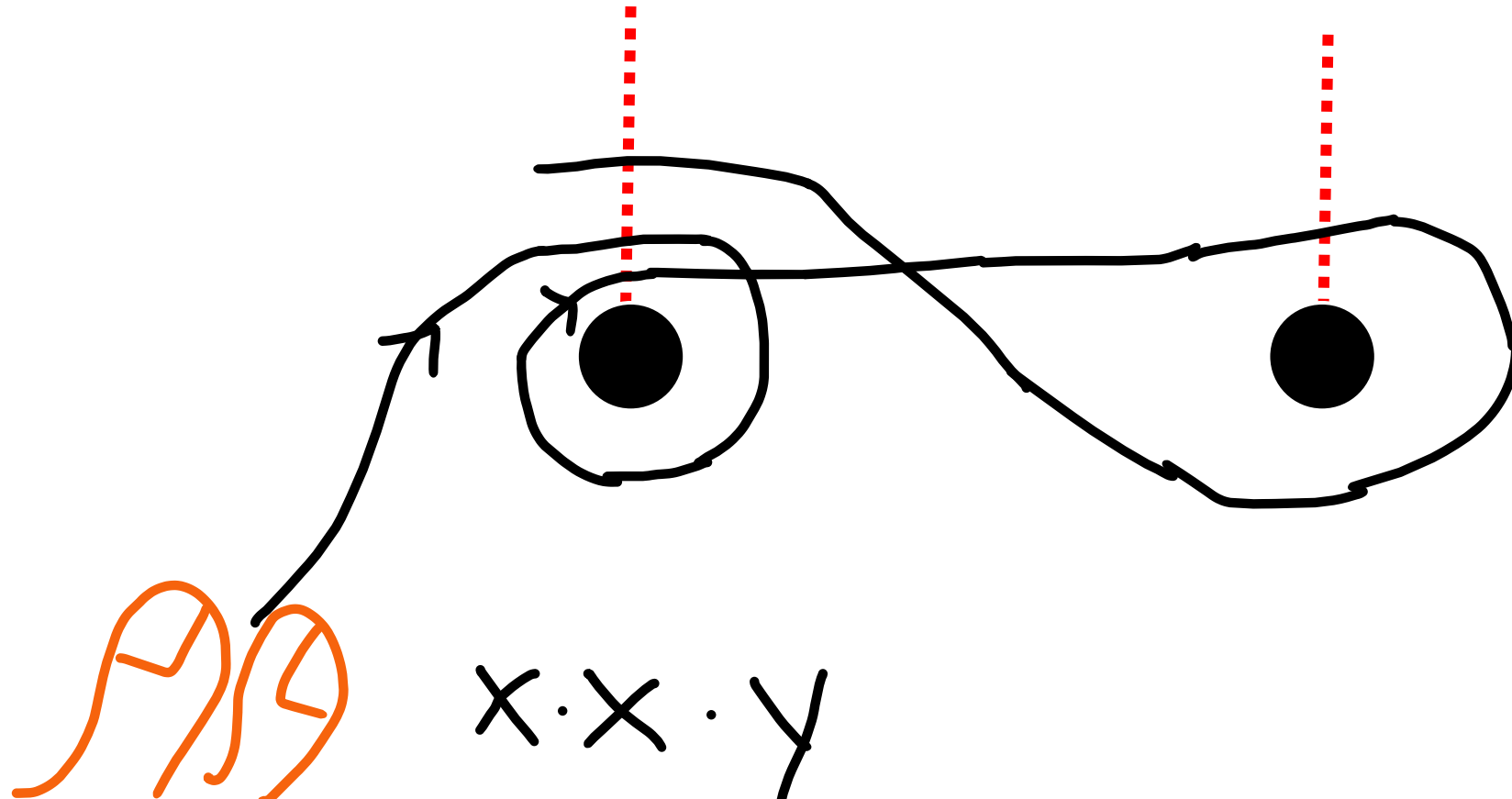


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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

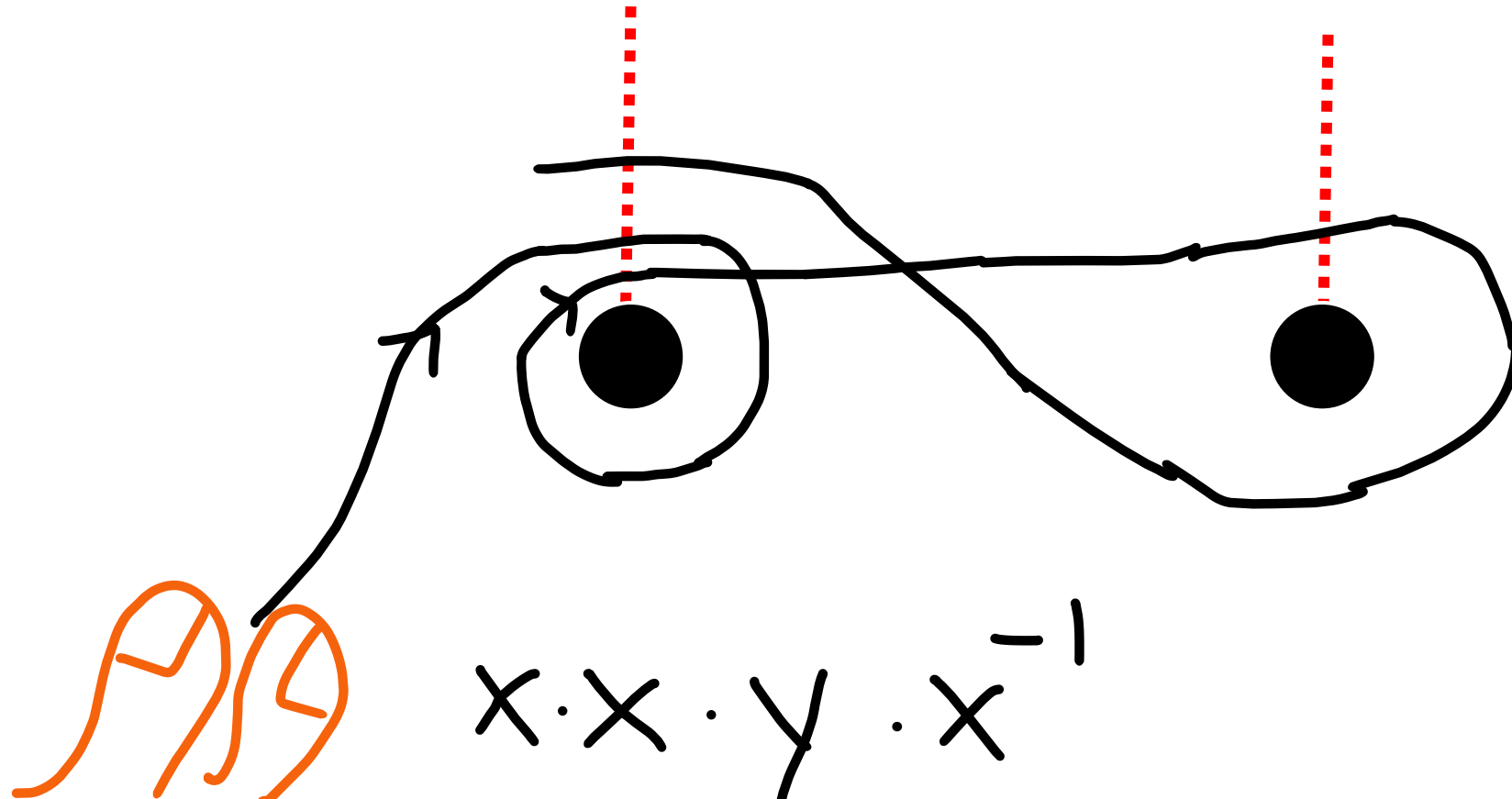


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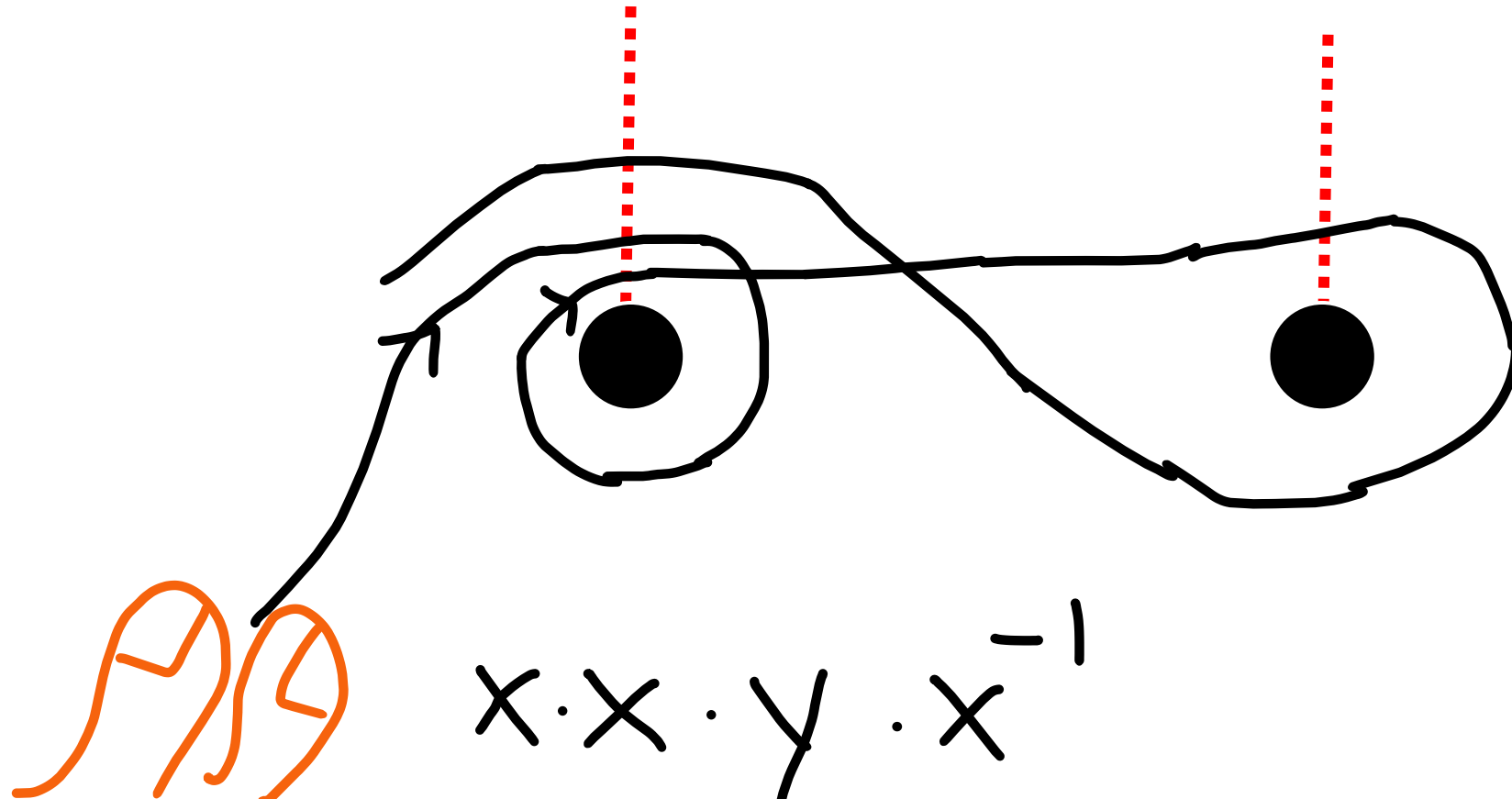


Cross over left nail clockwise: write x

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Cross over right nail clockwise: write y

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

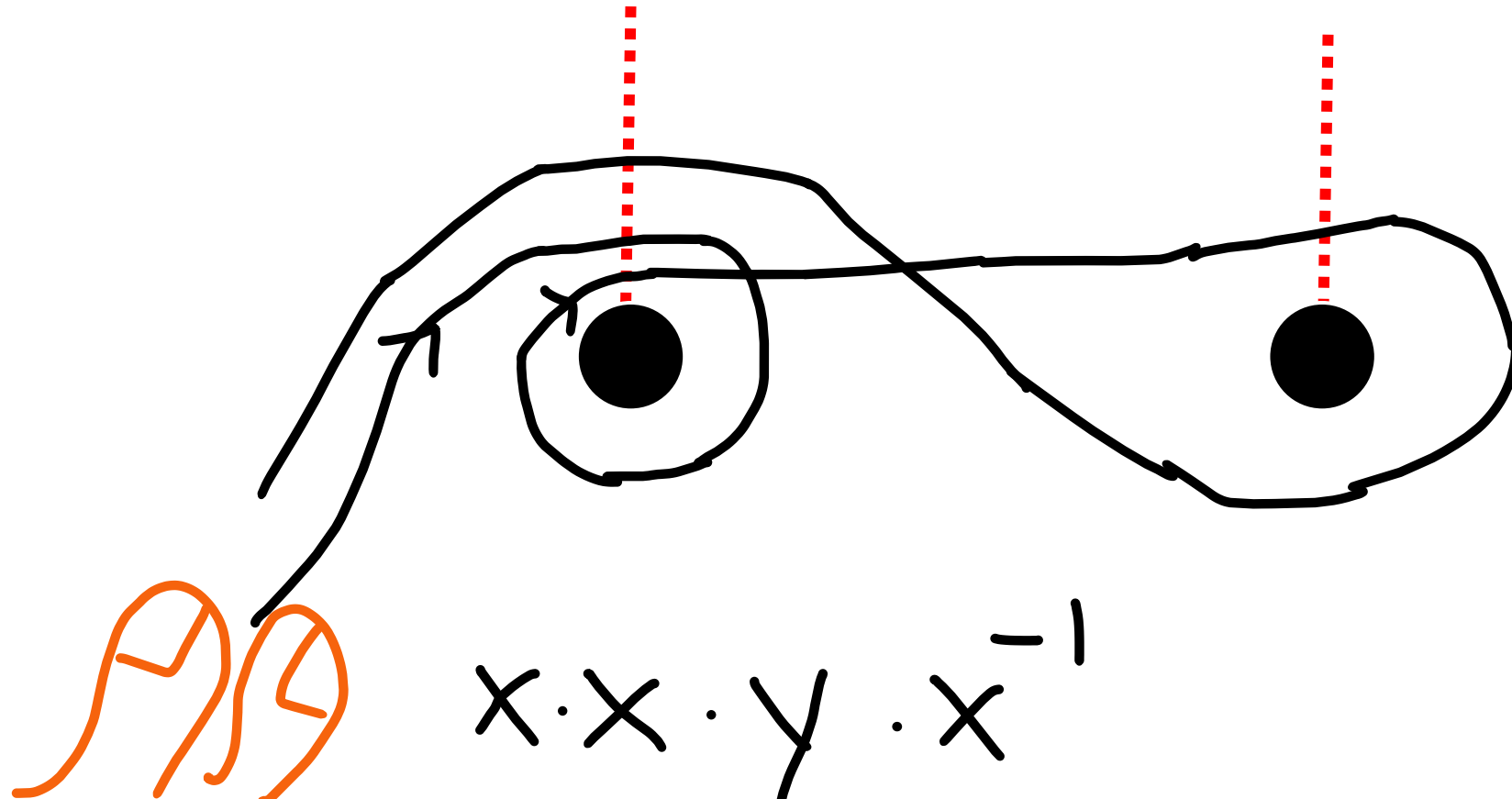


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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

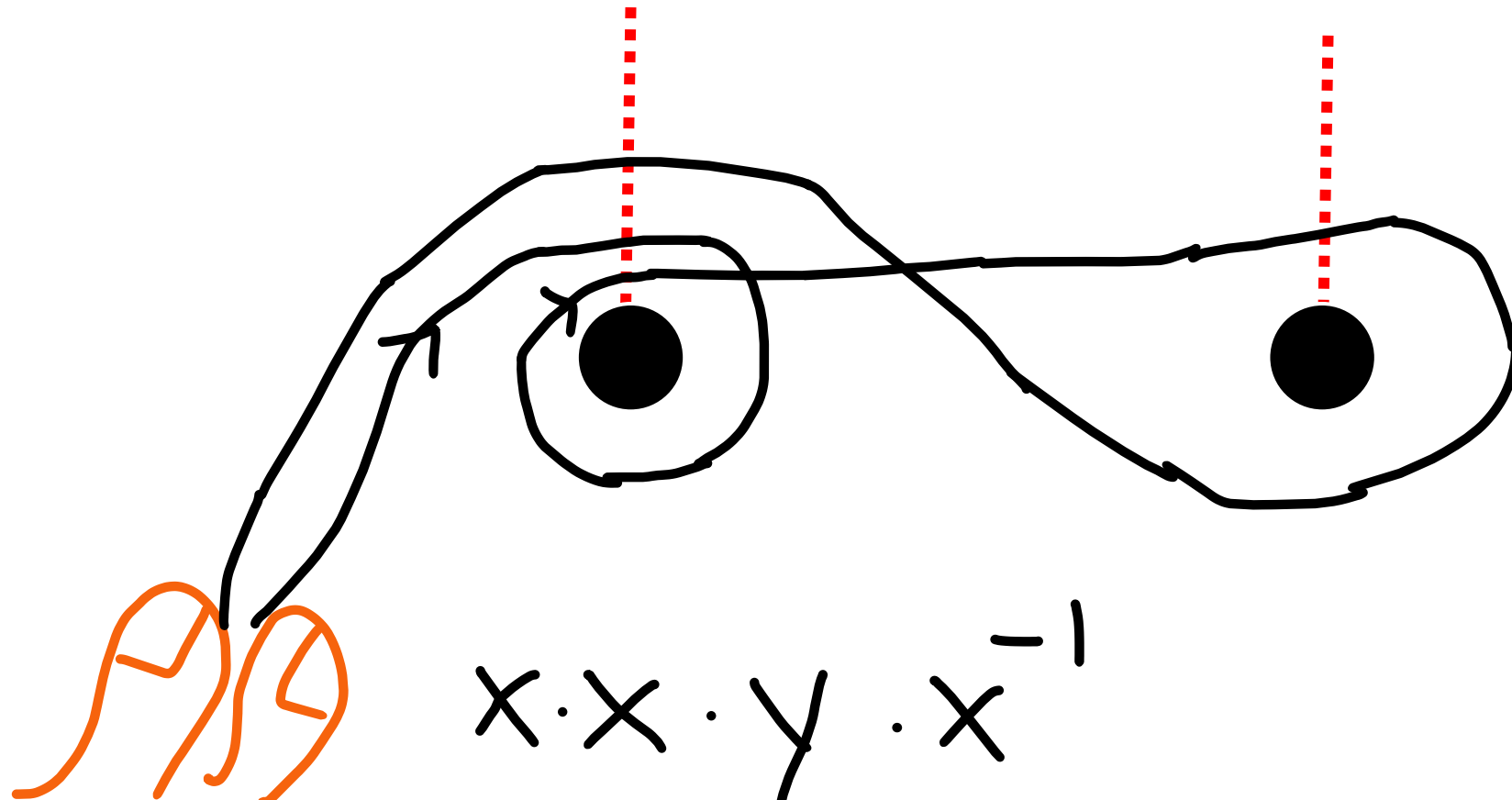


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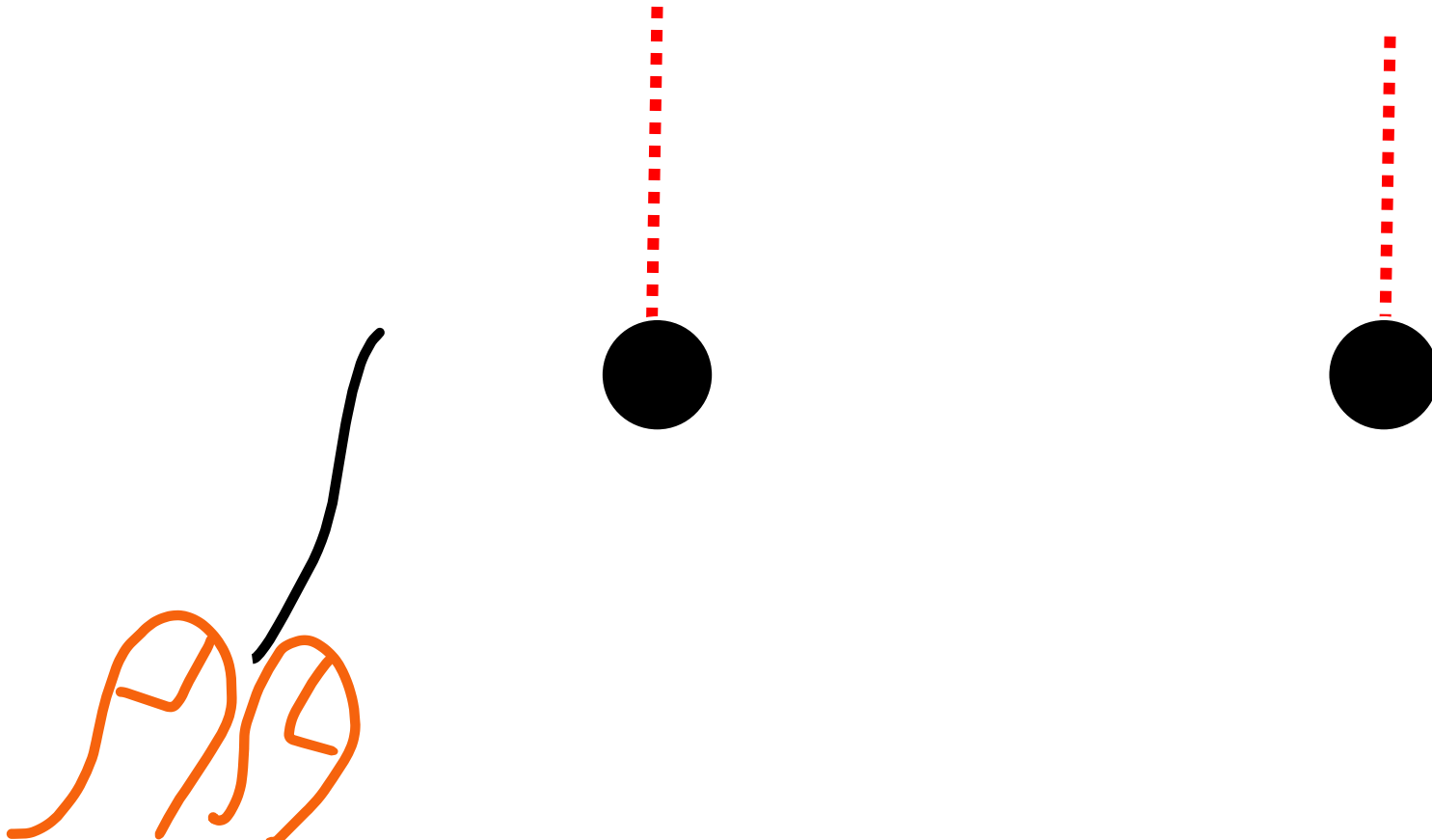
Example 2

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}

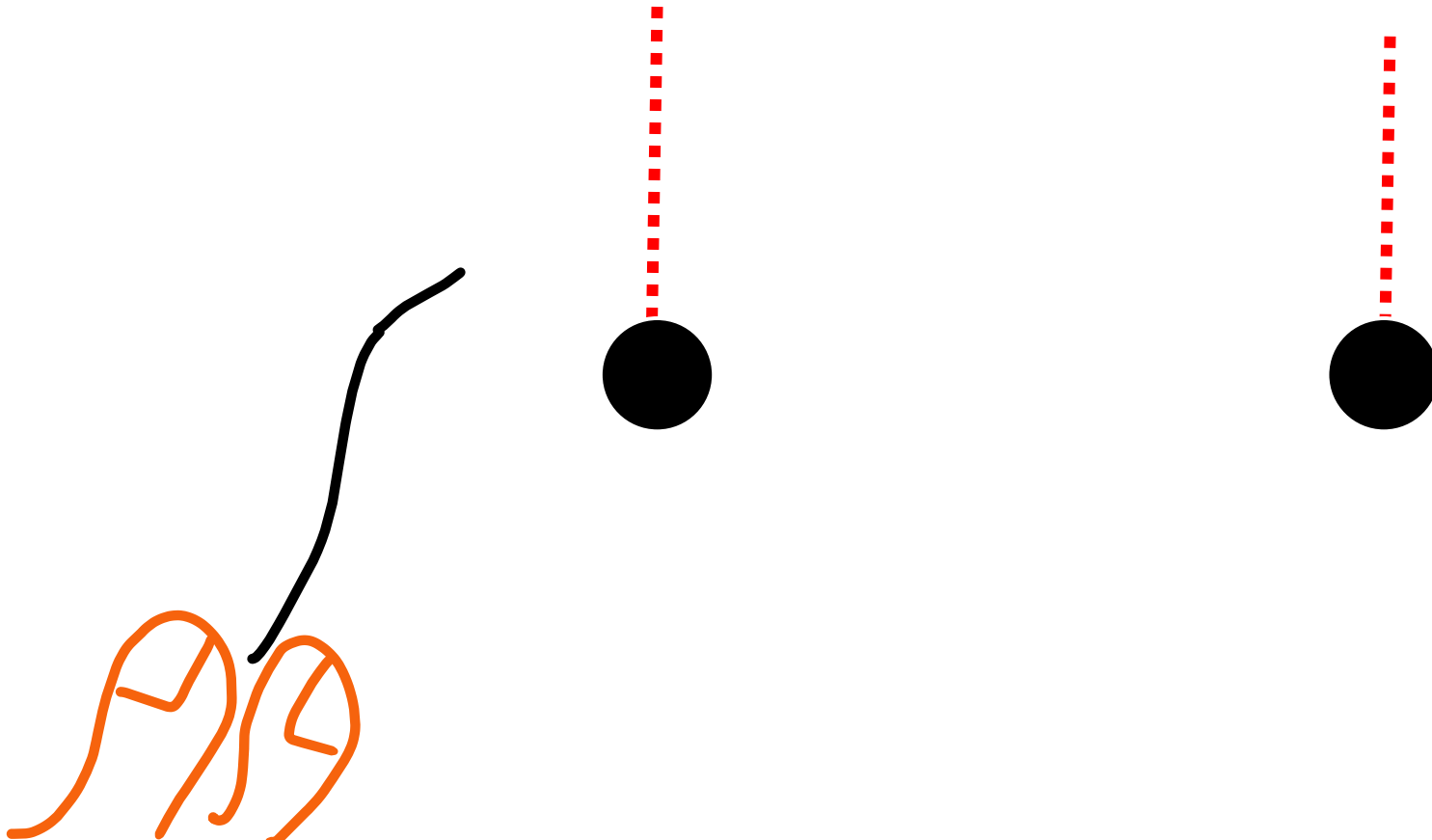


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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

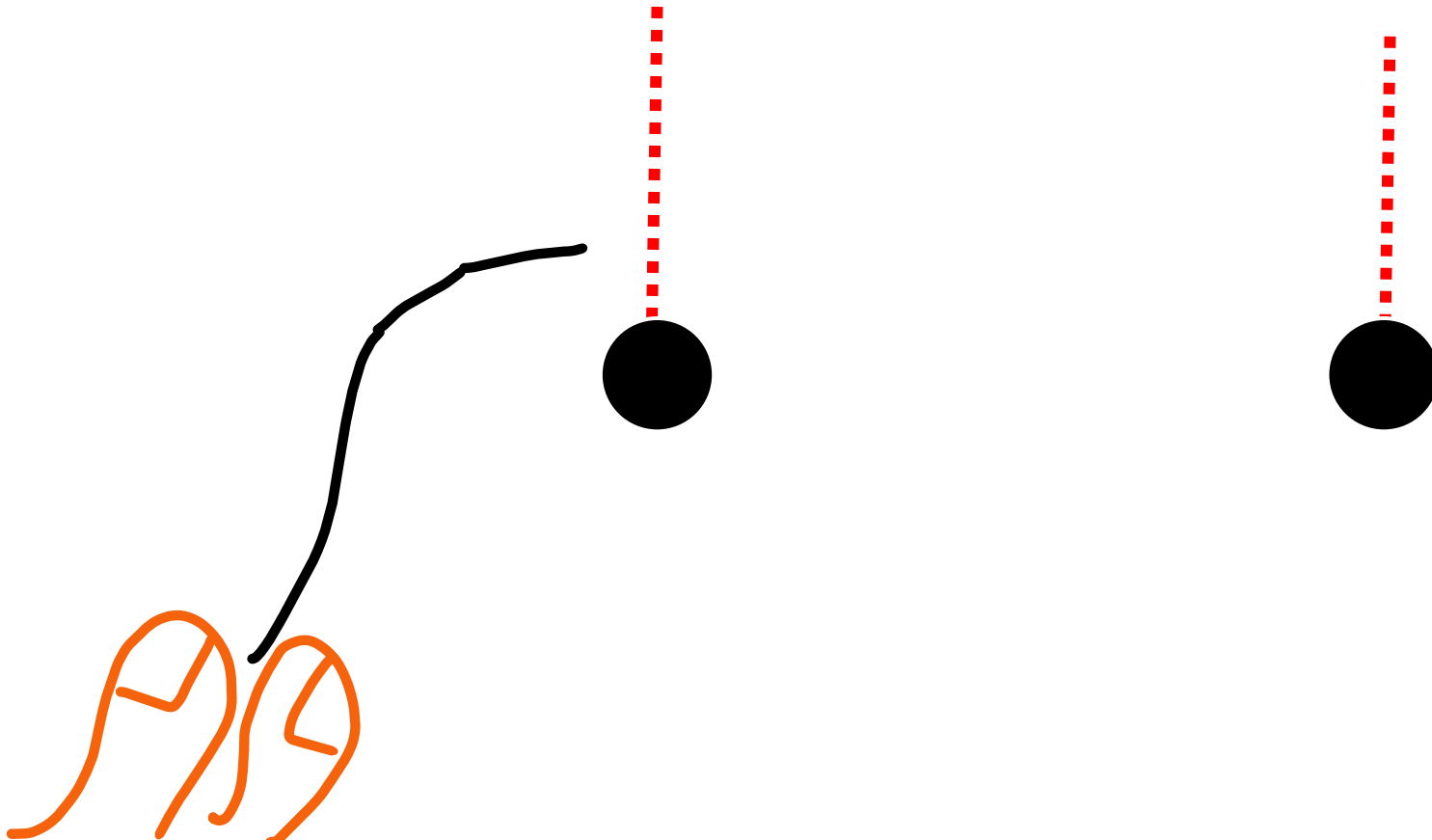


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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

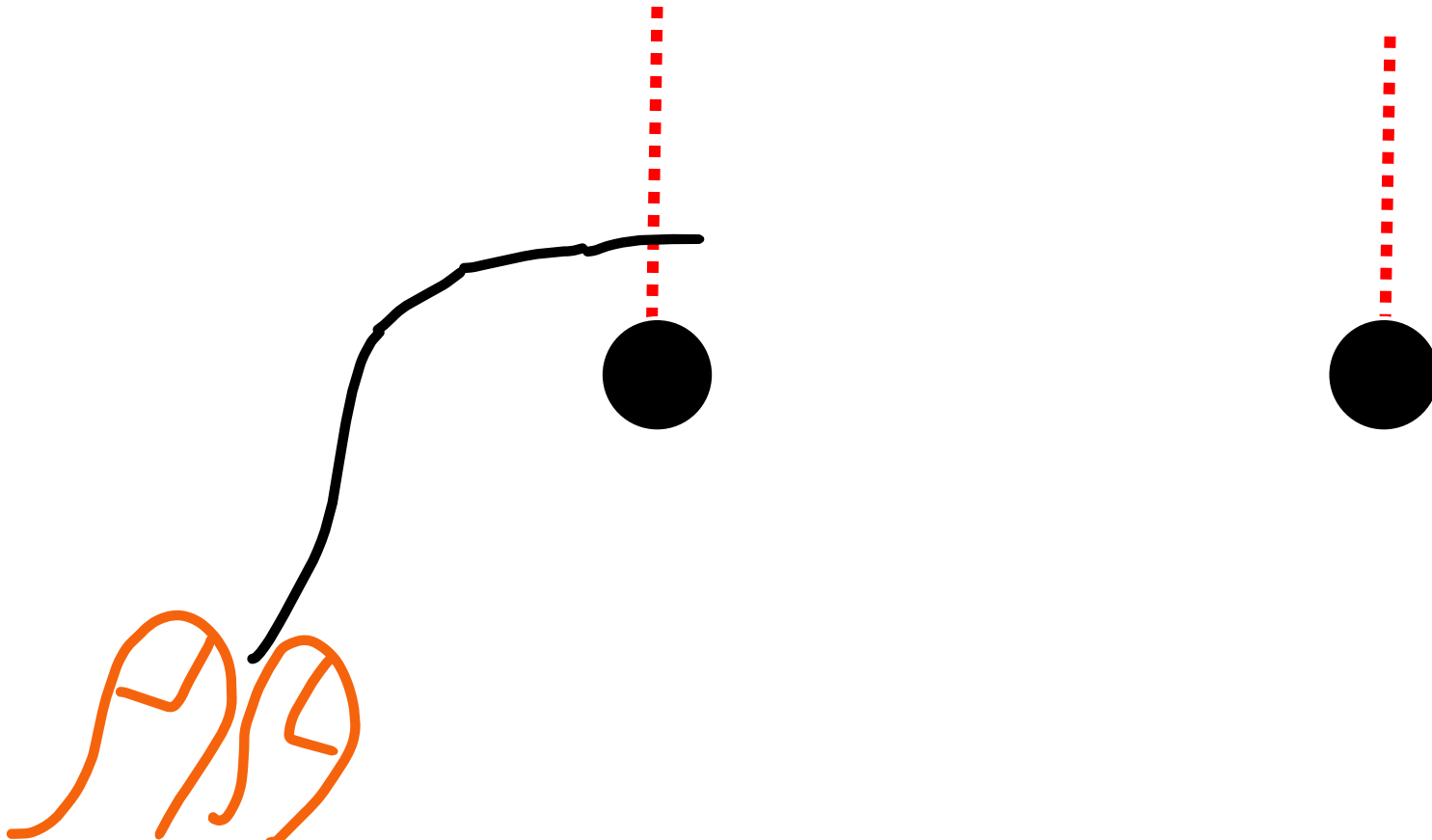


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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

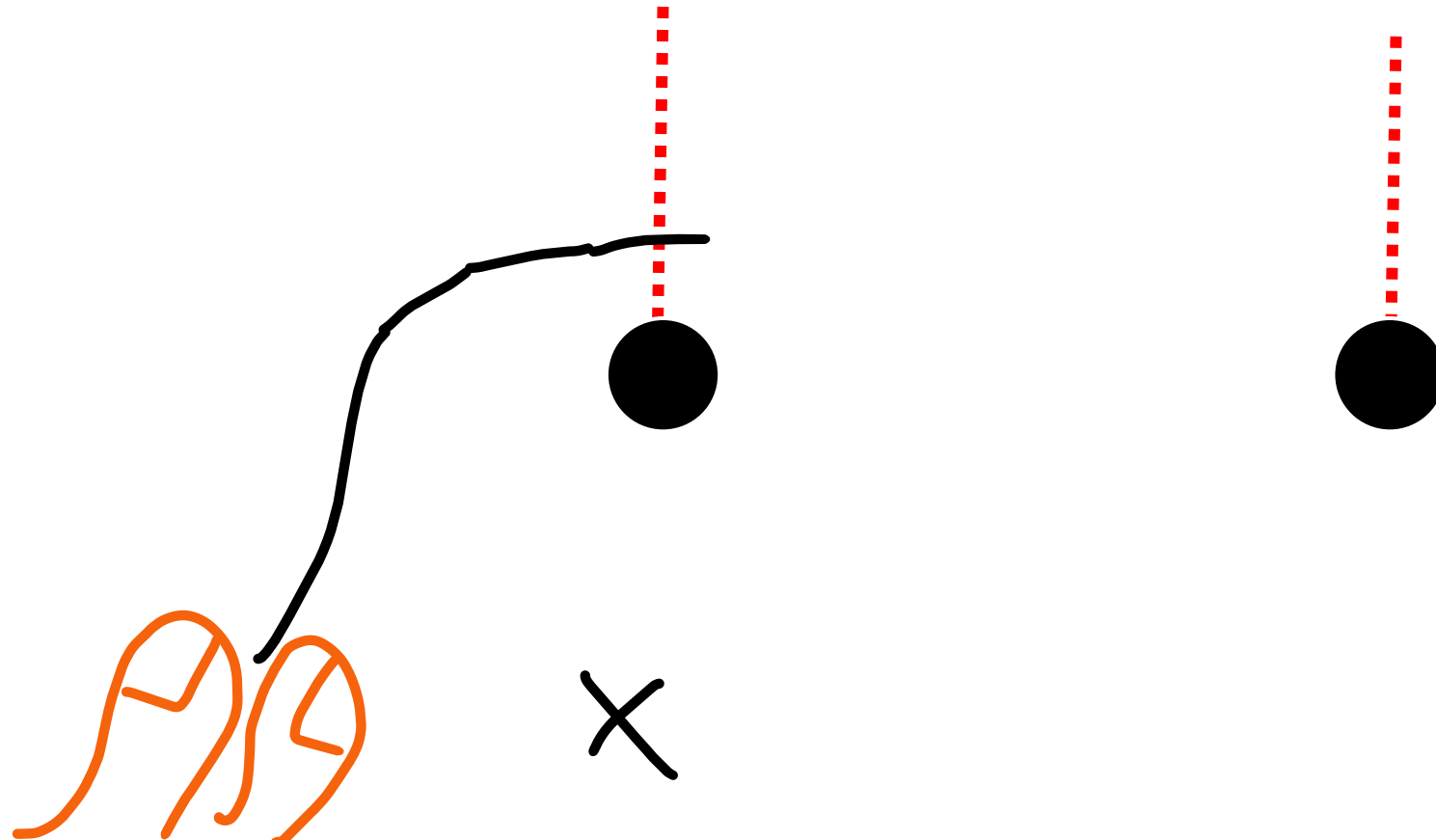


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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

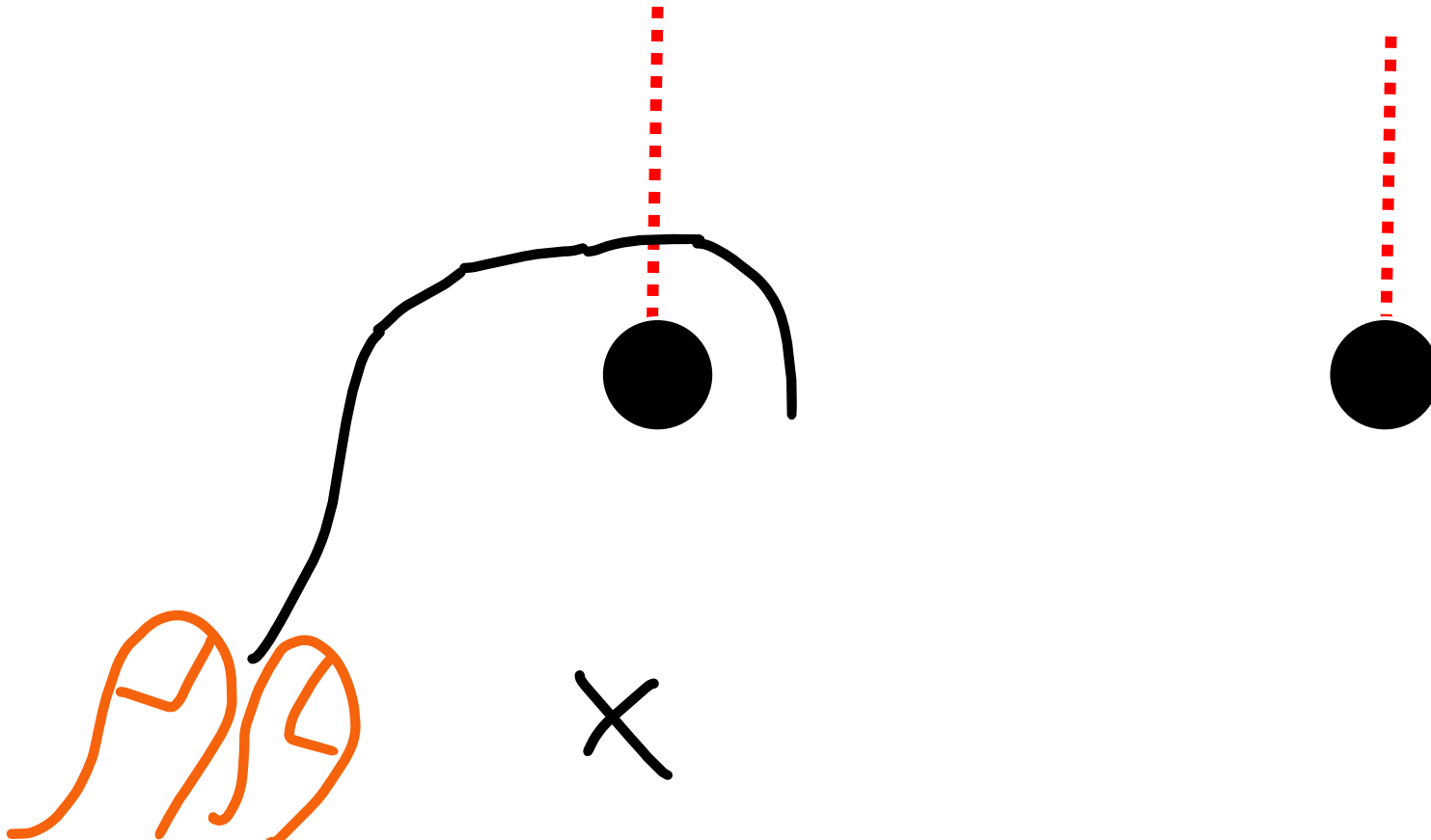


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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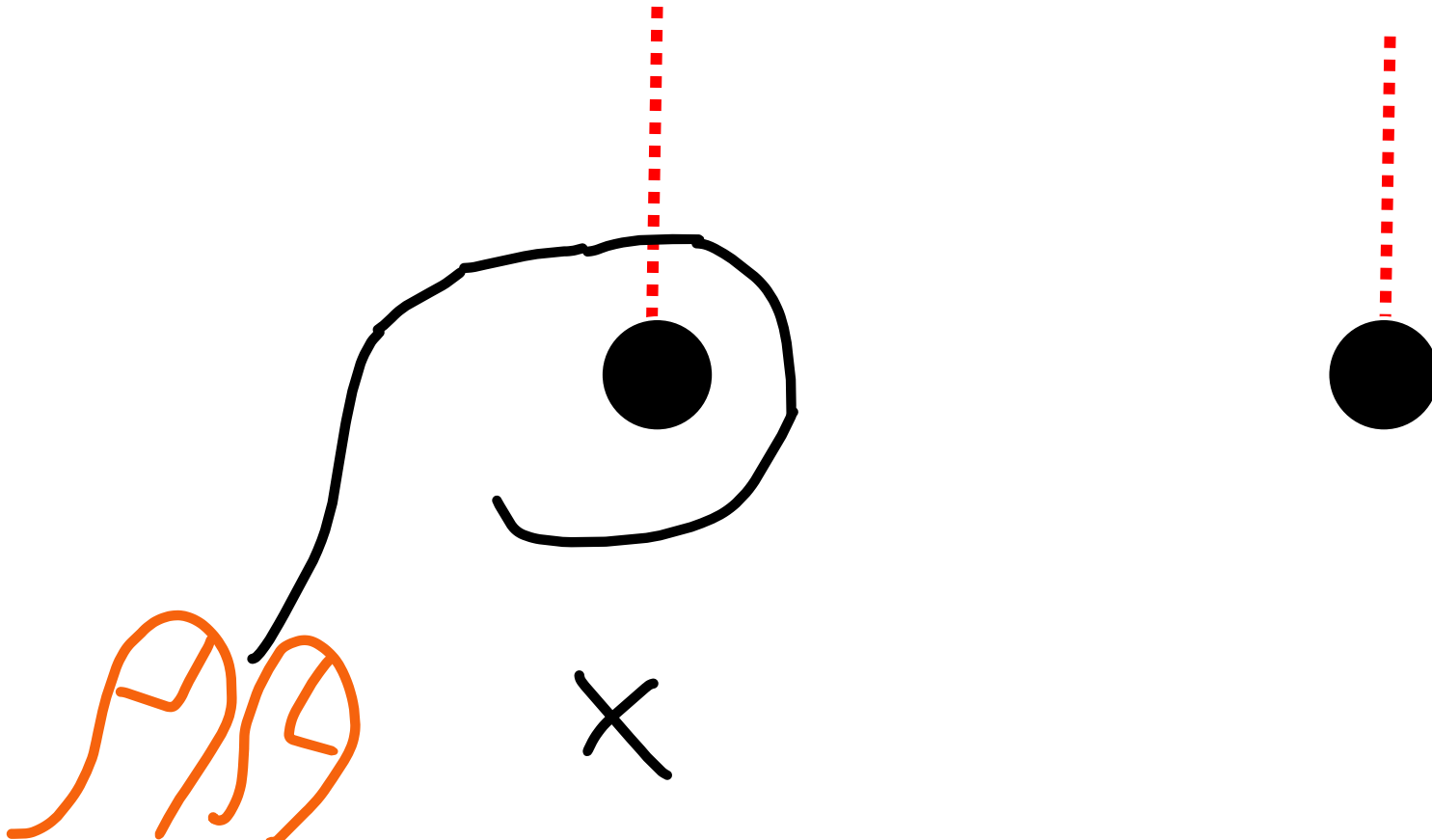


Cross over left nail clockwise: write x

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

Cross over right nail clockwise: write y

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

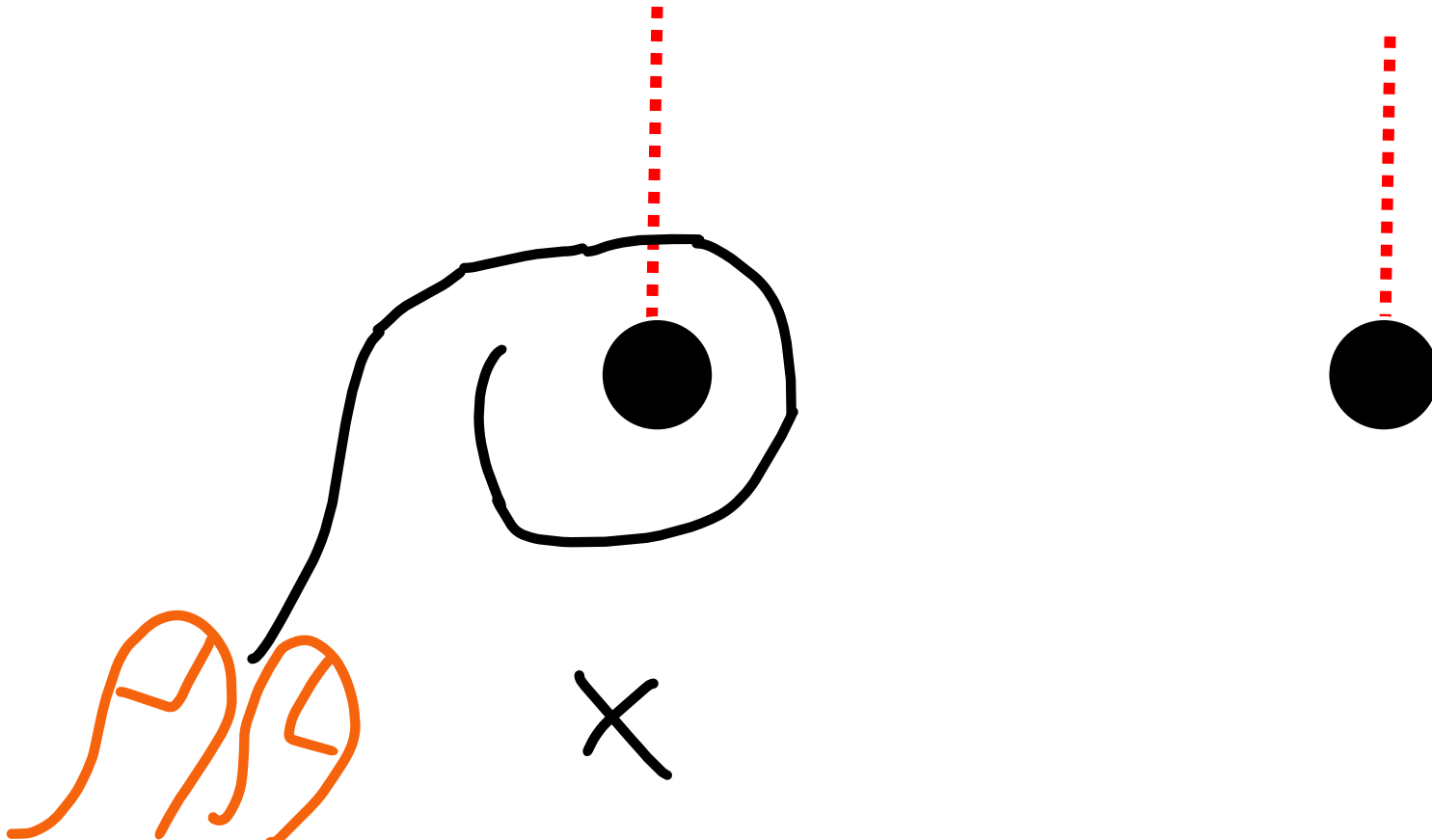


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Cross over left nail counterclockwise: write x^{-1}

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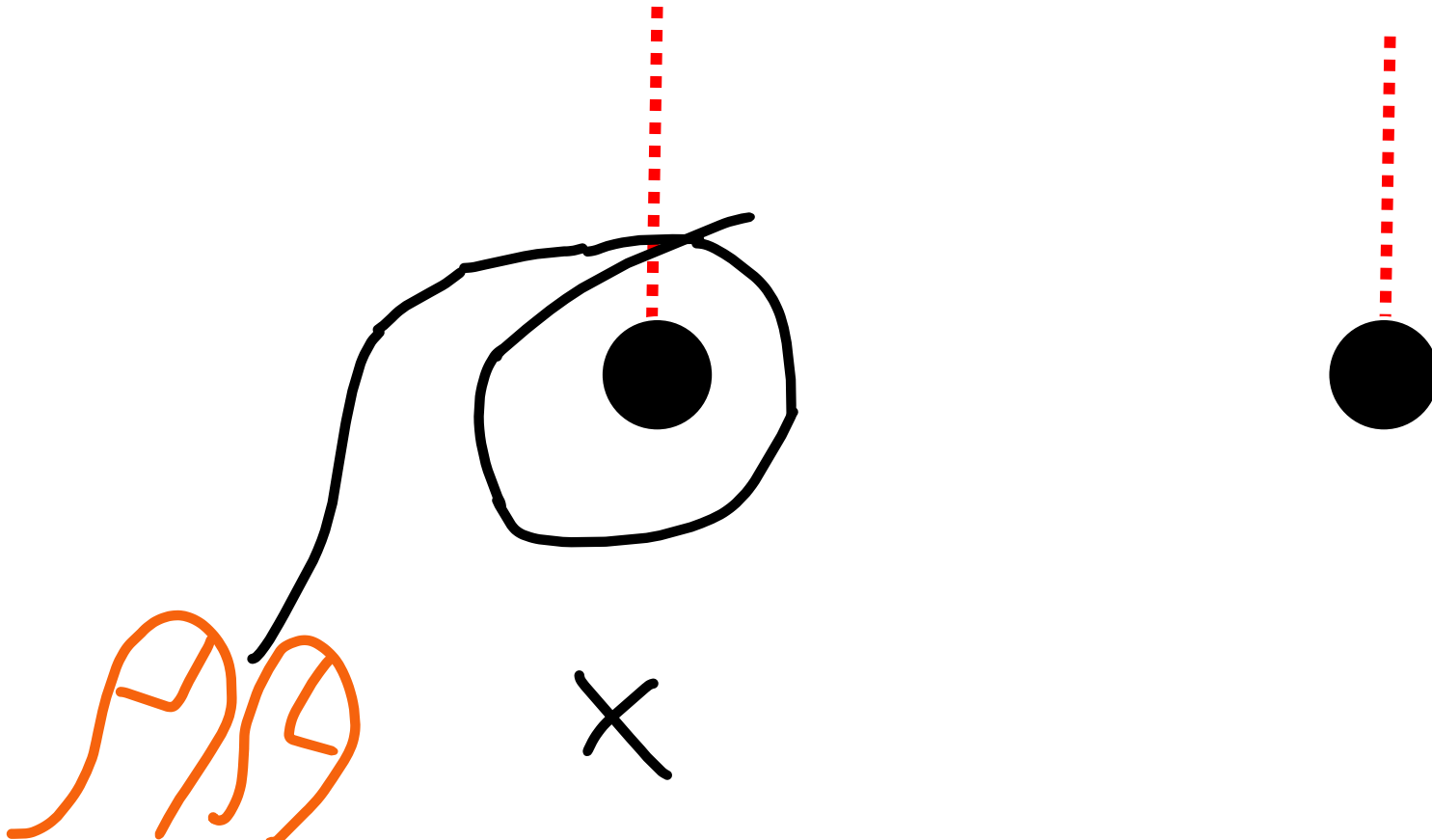


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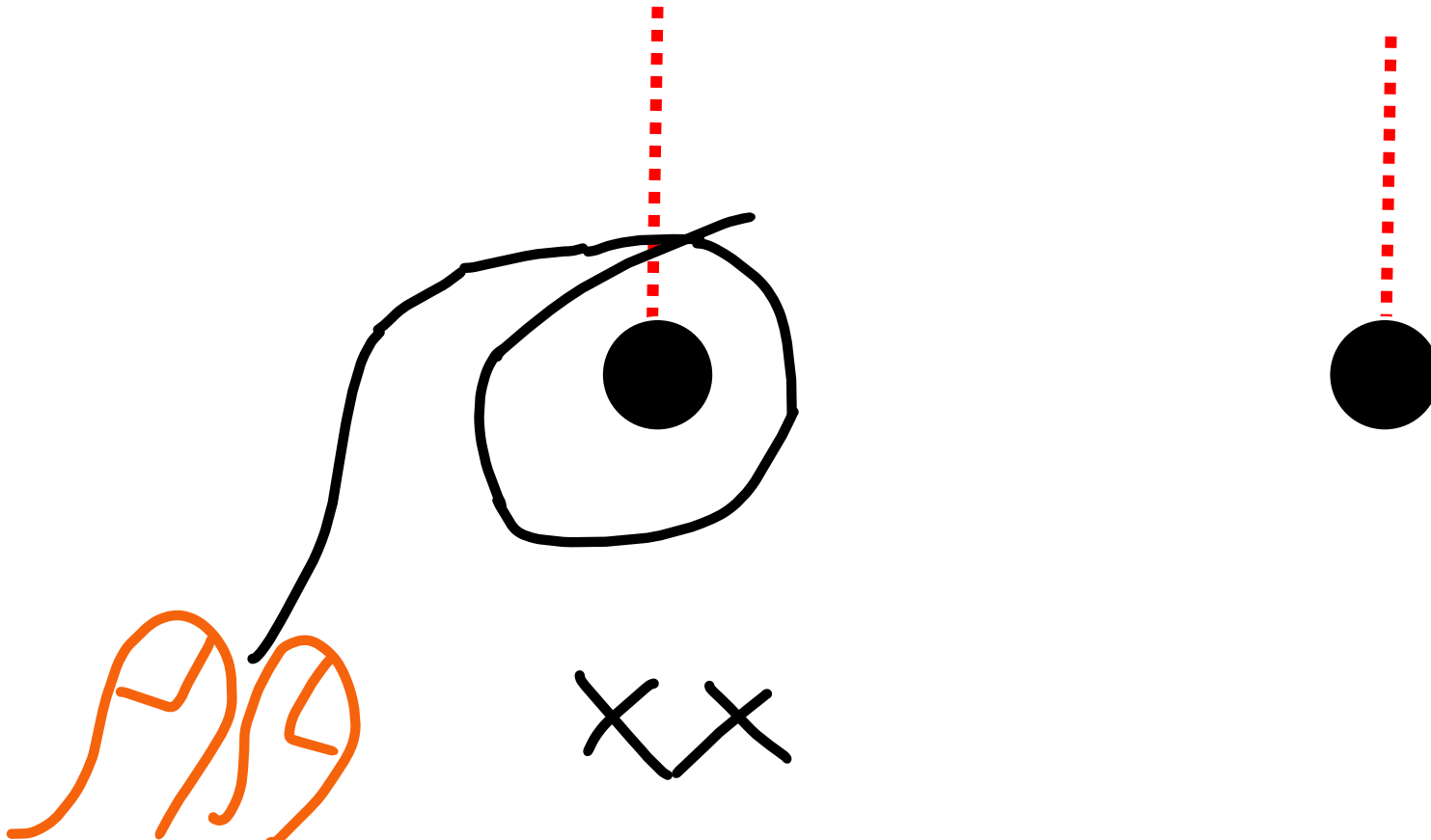


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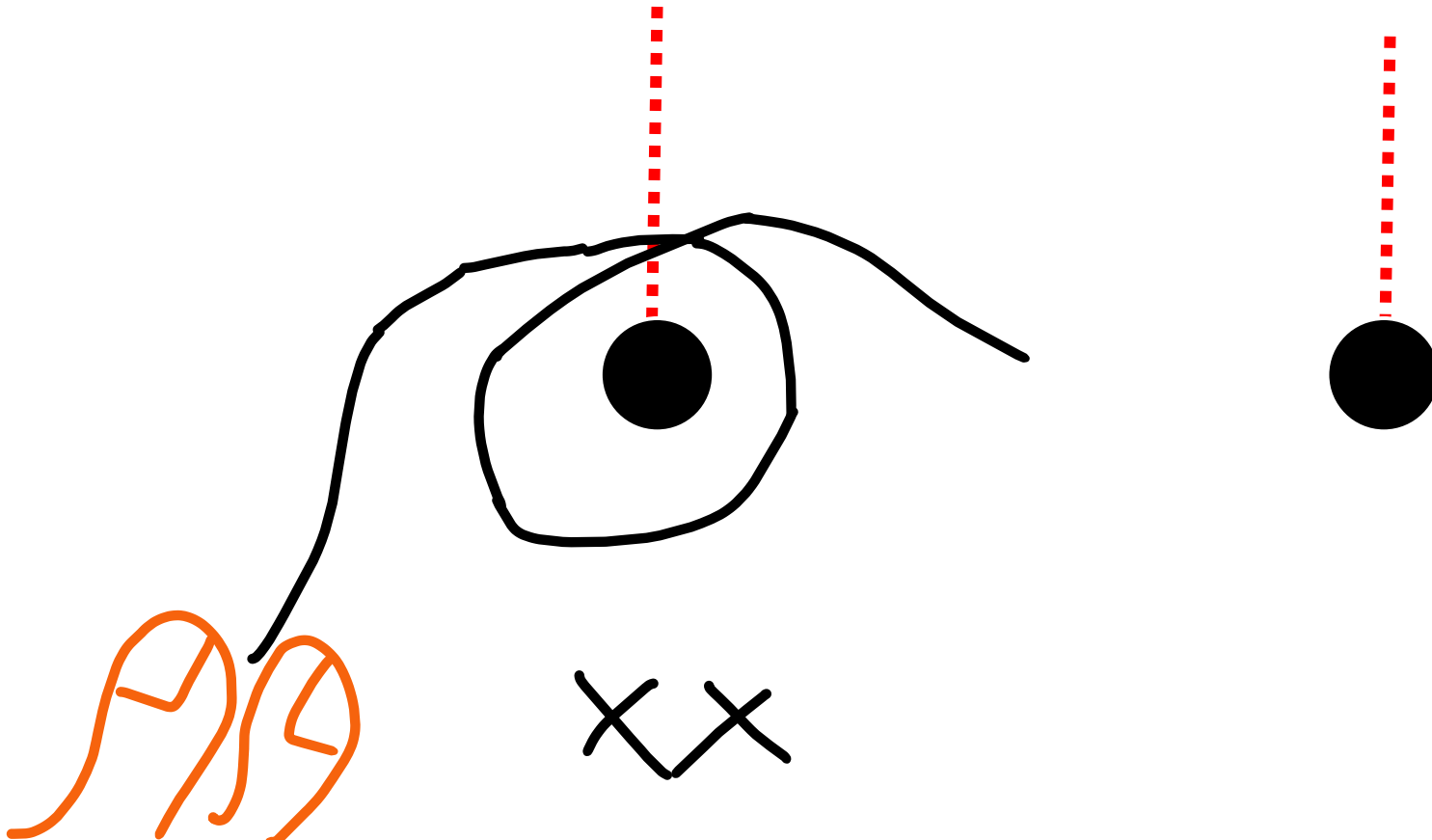


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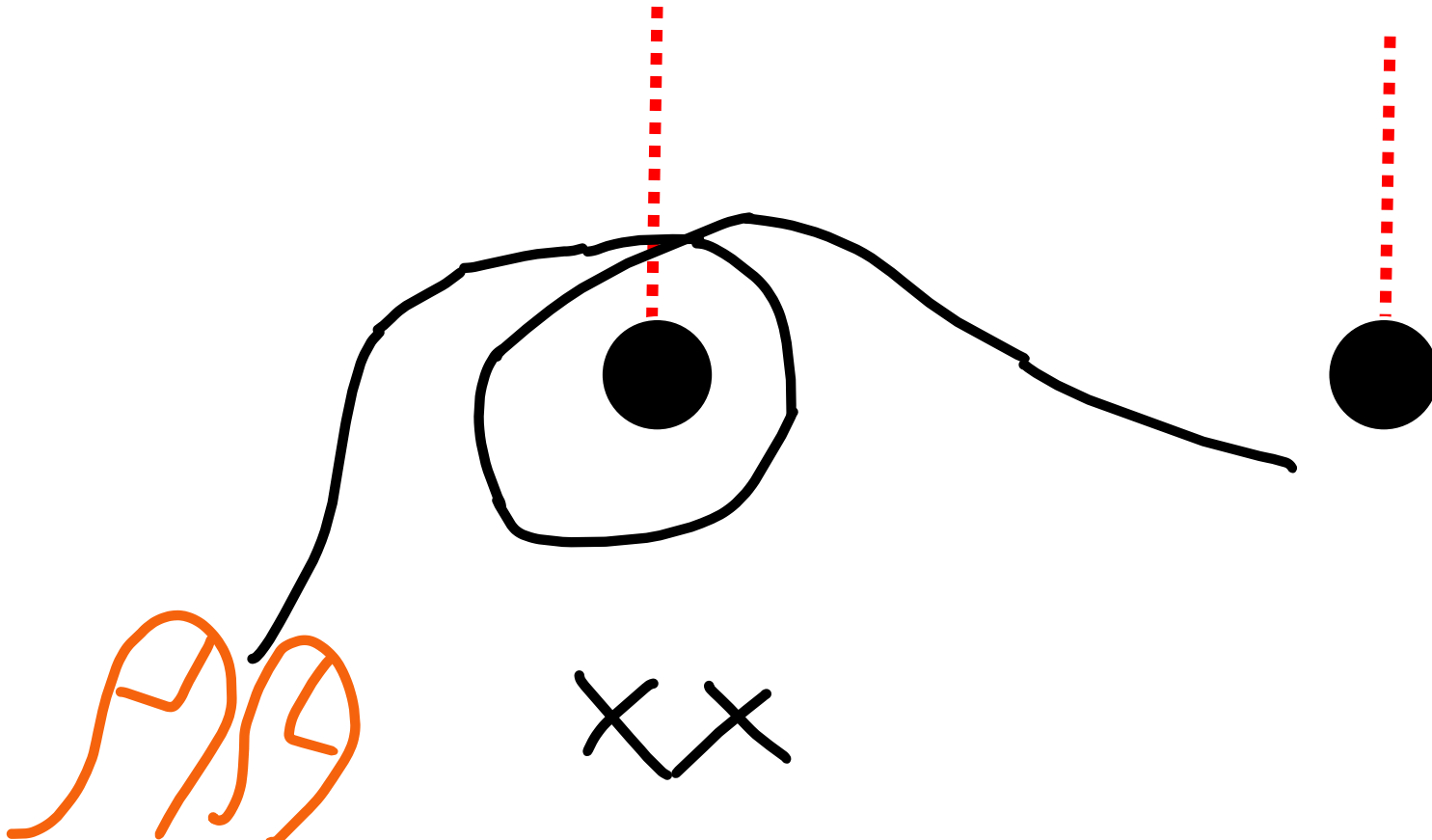


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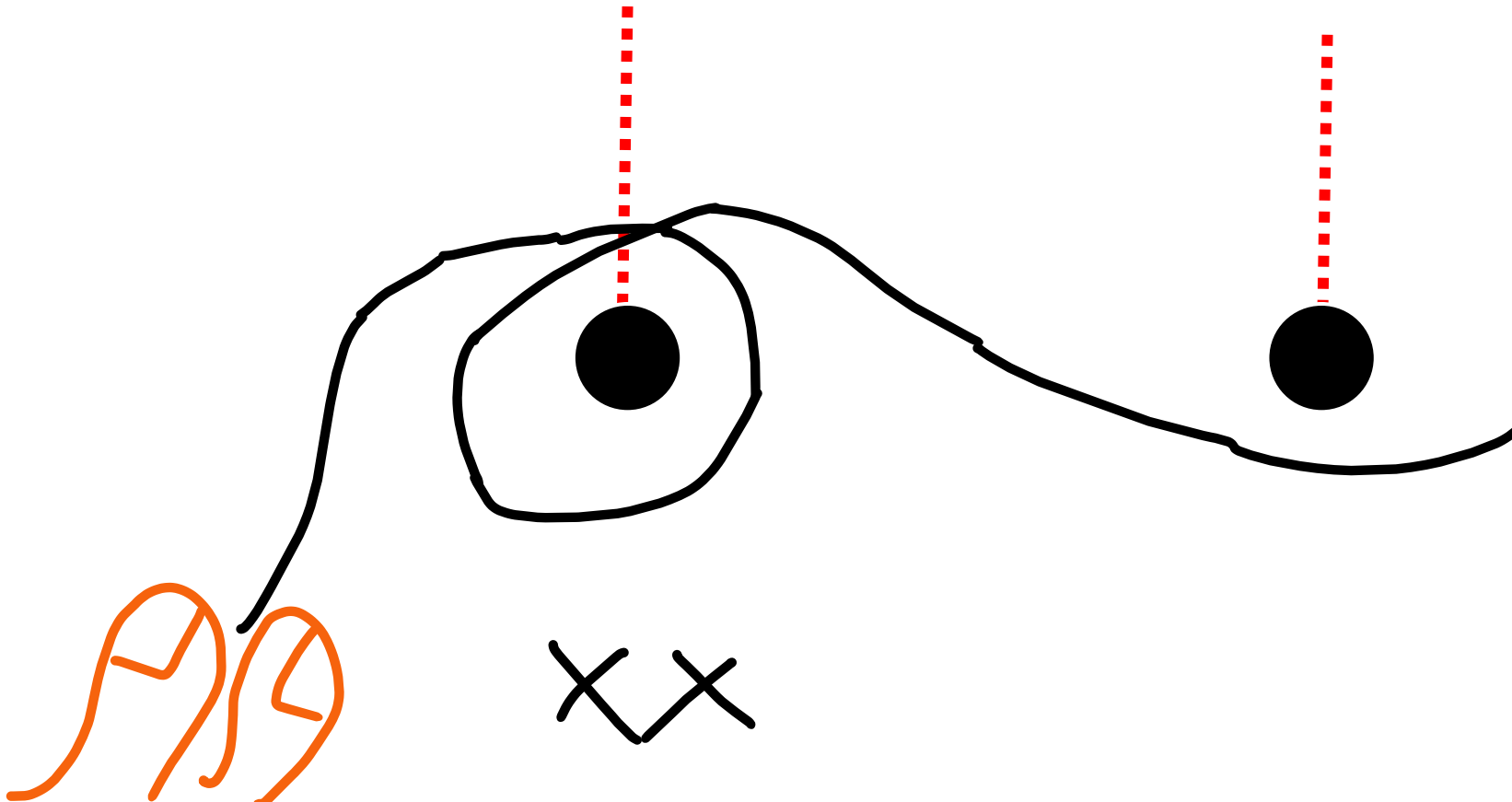


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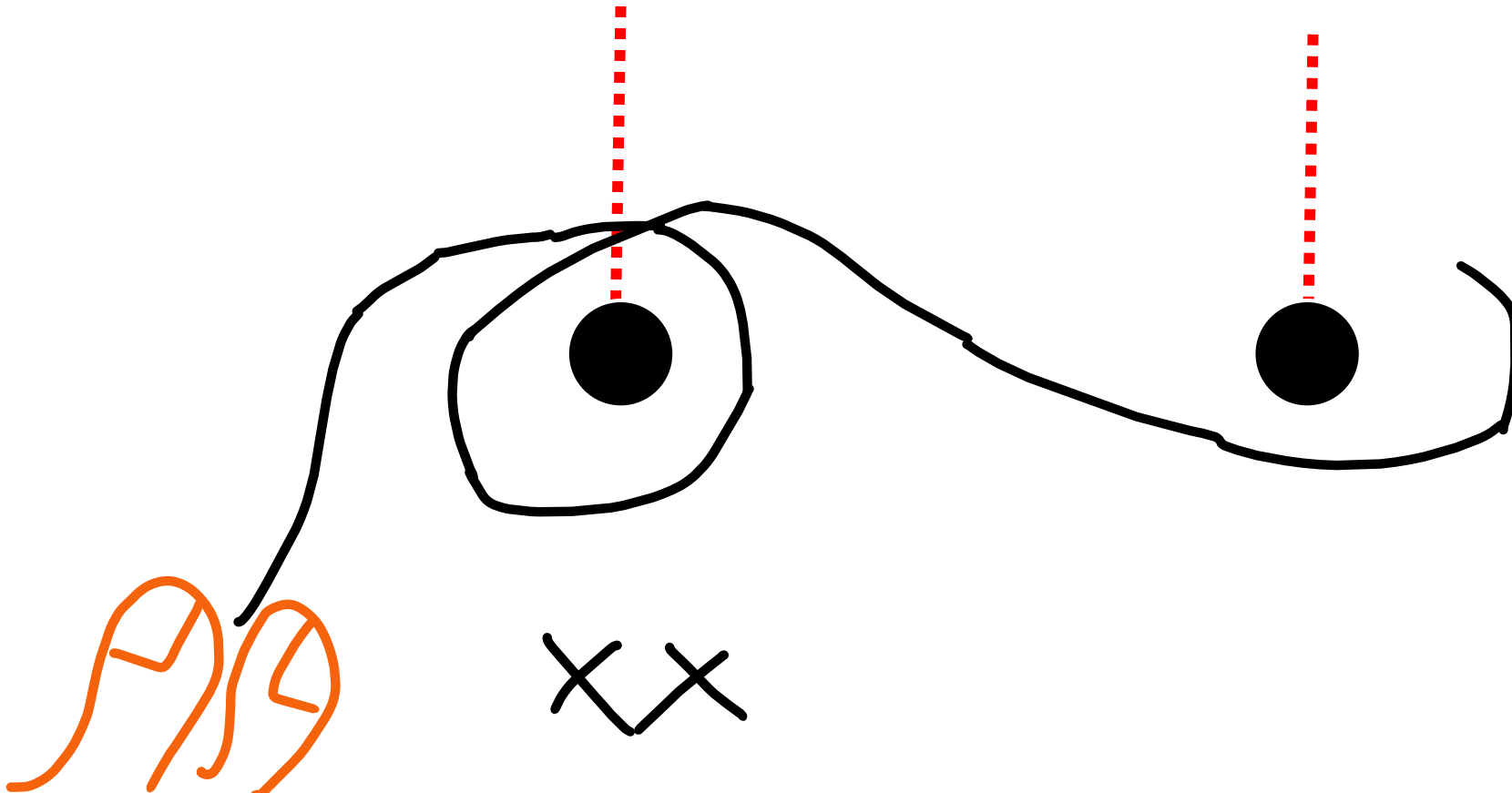


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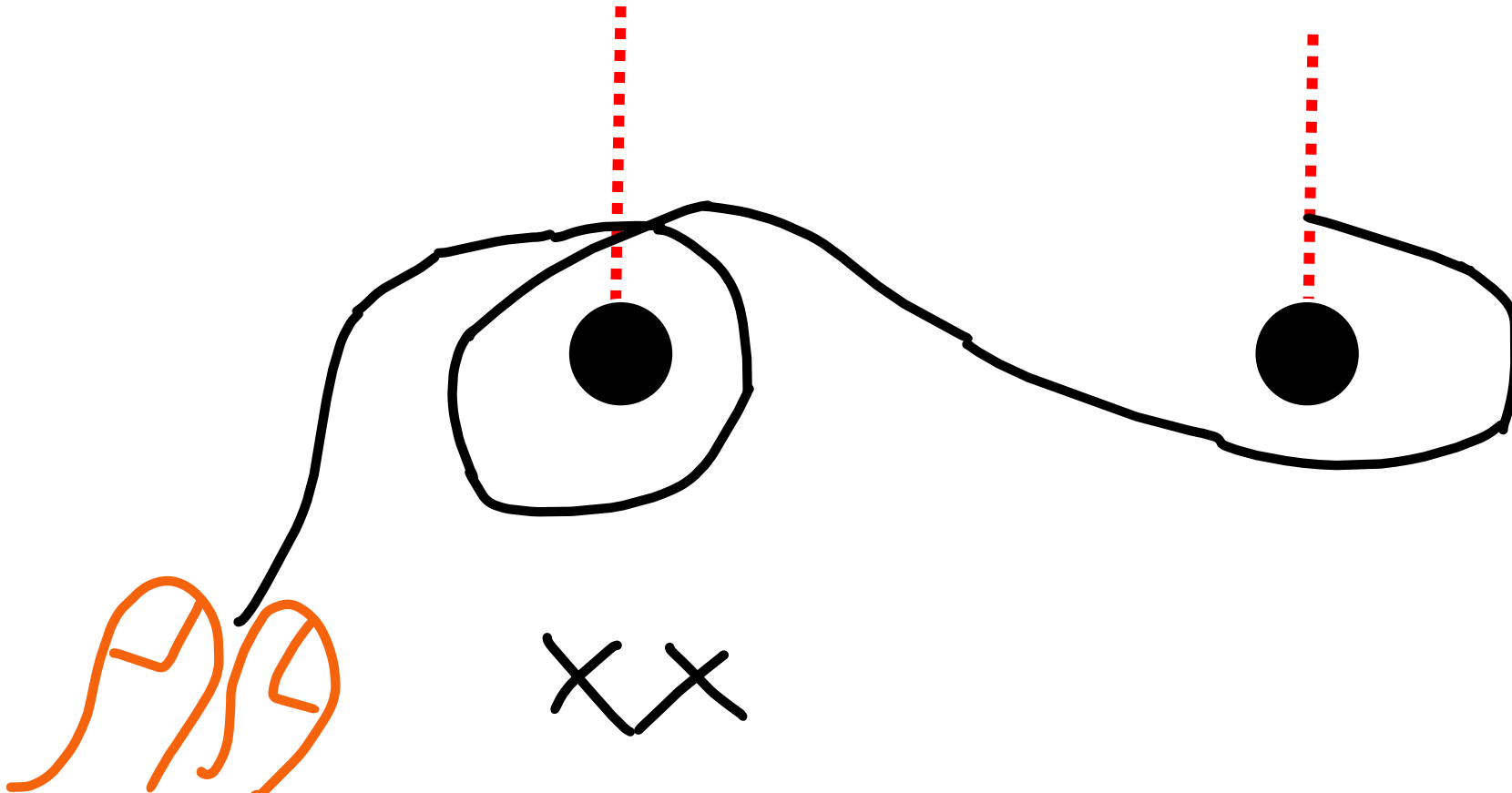


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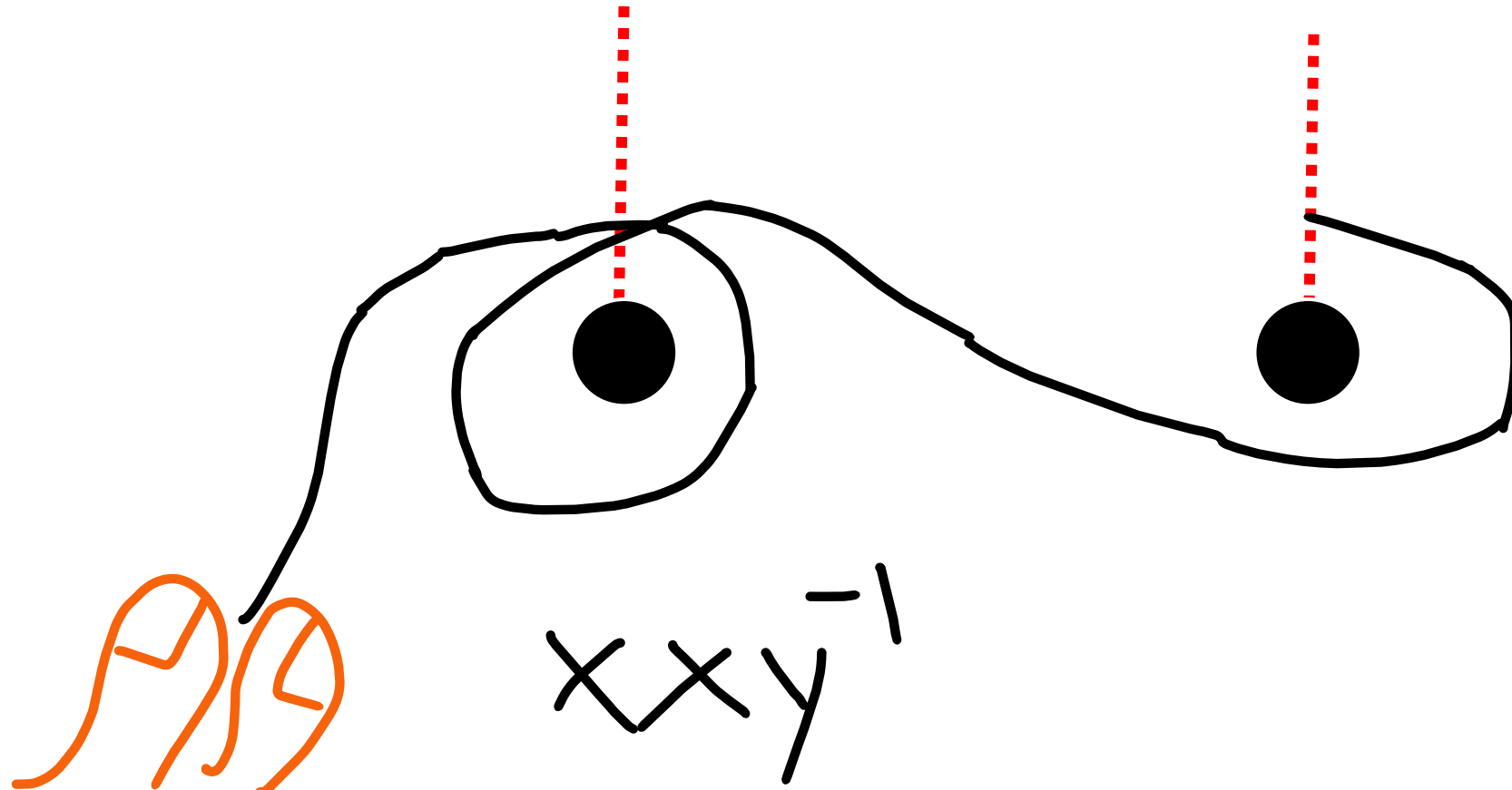


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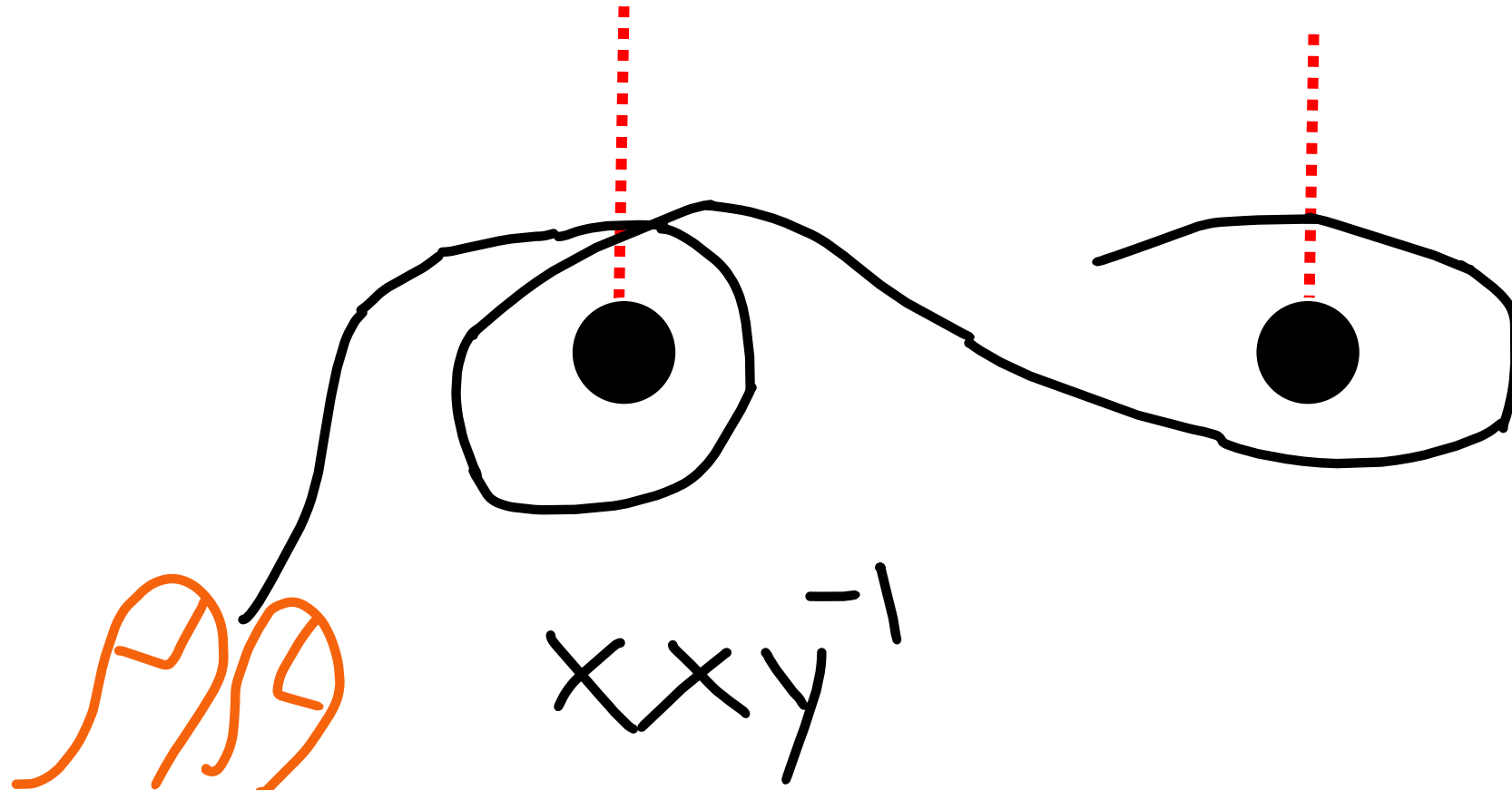


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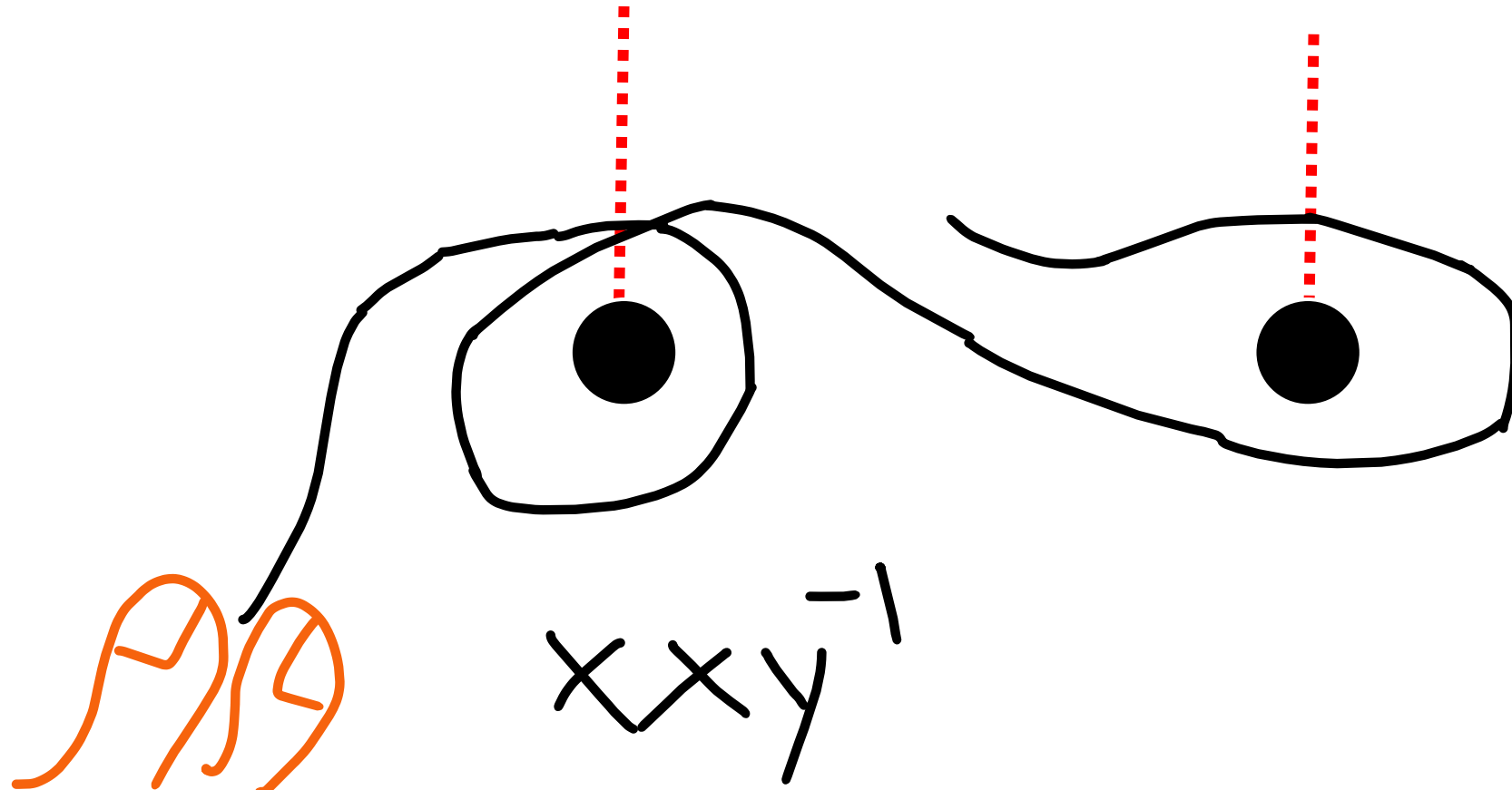


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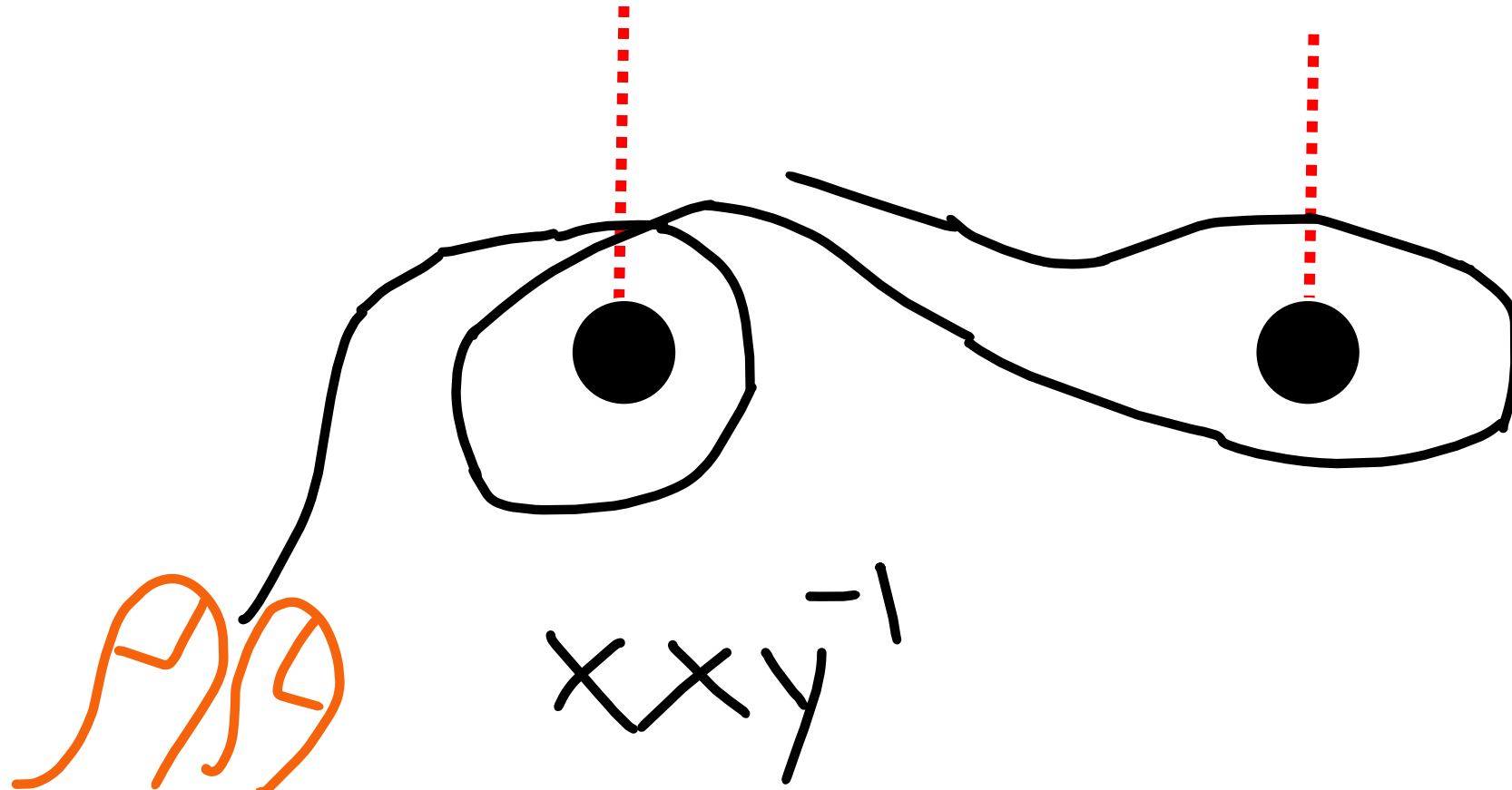


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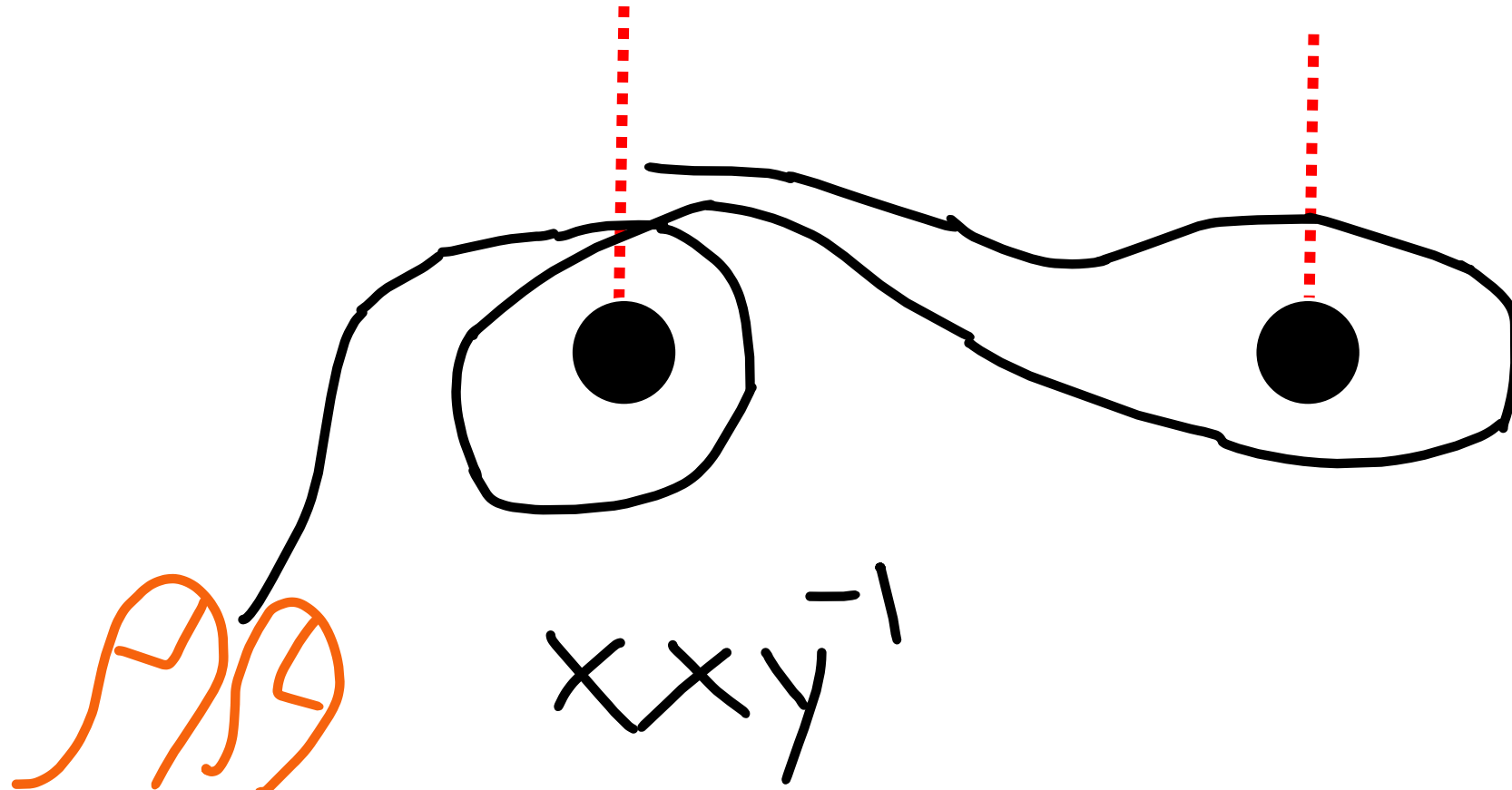


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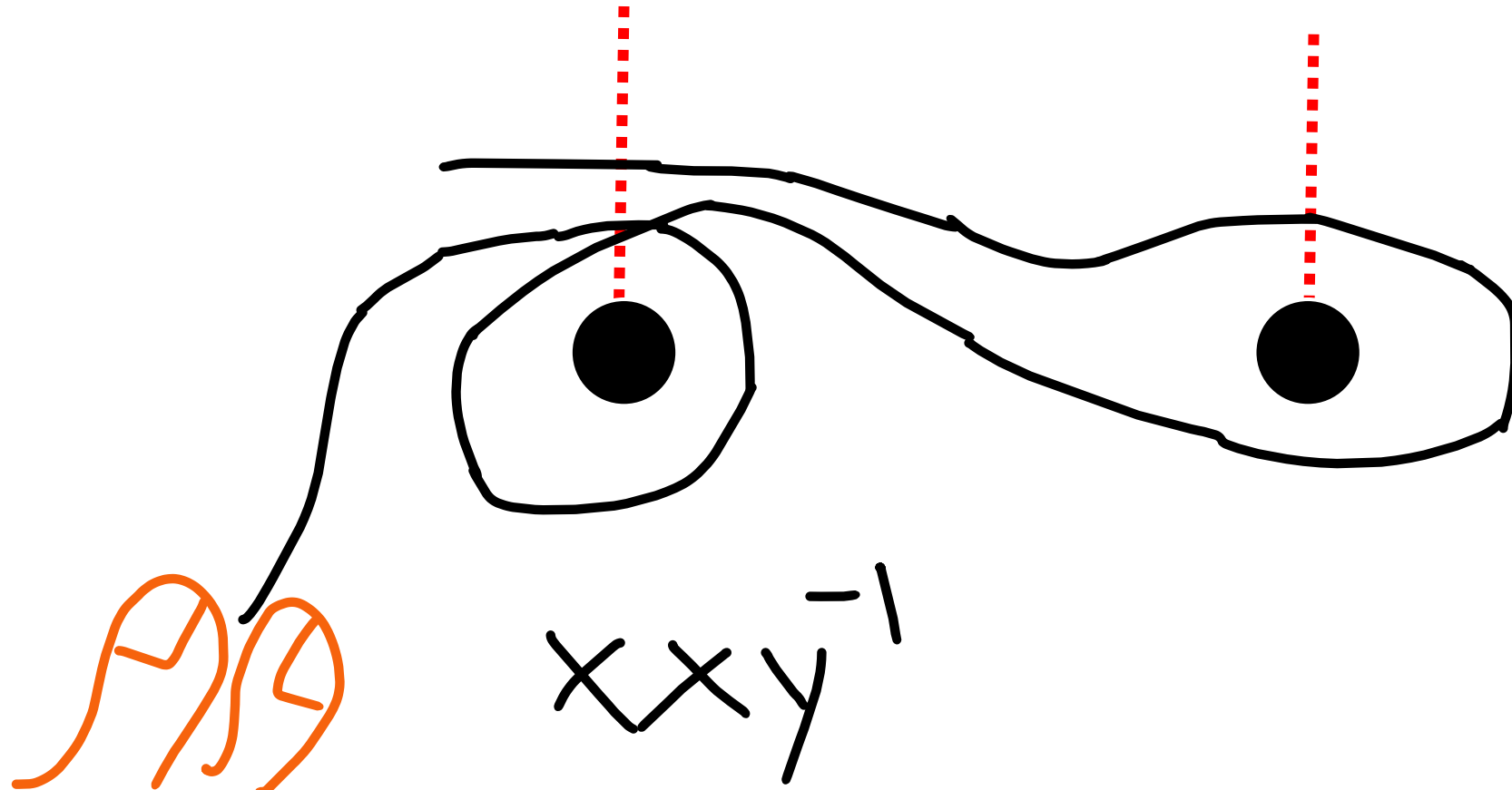


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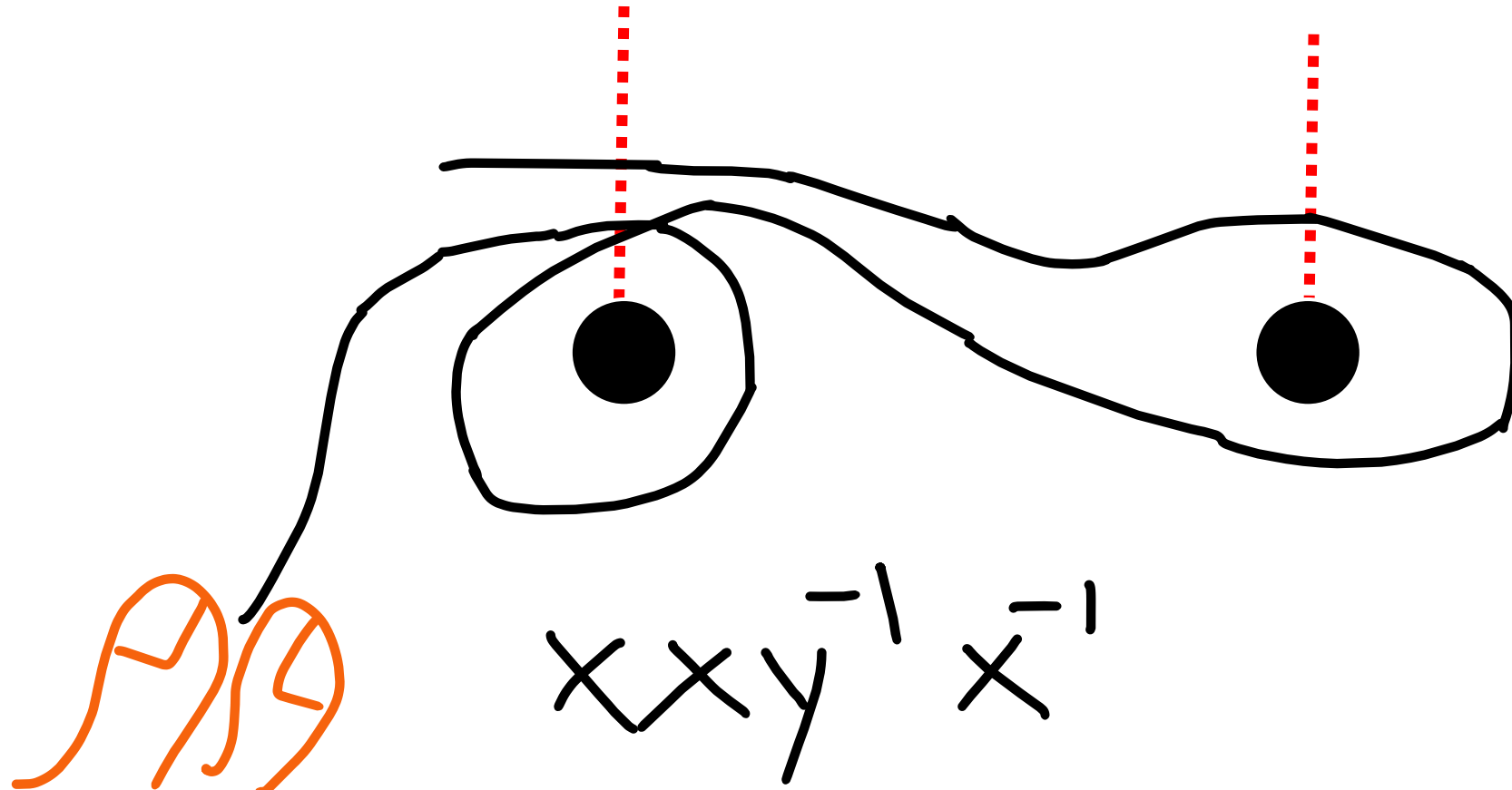


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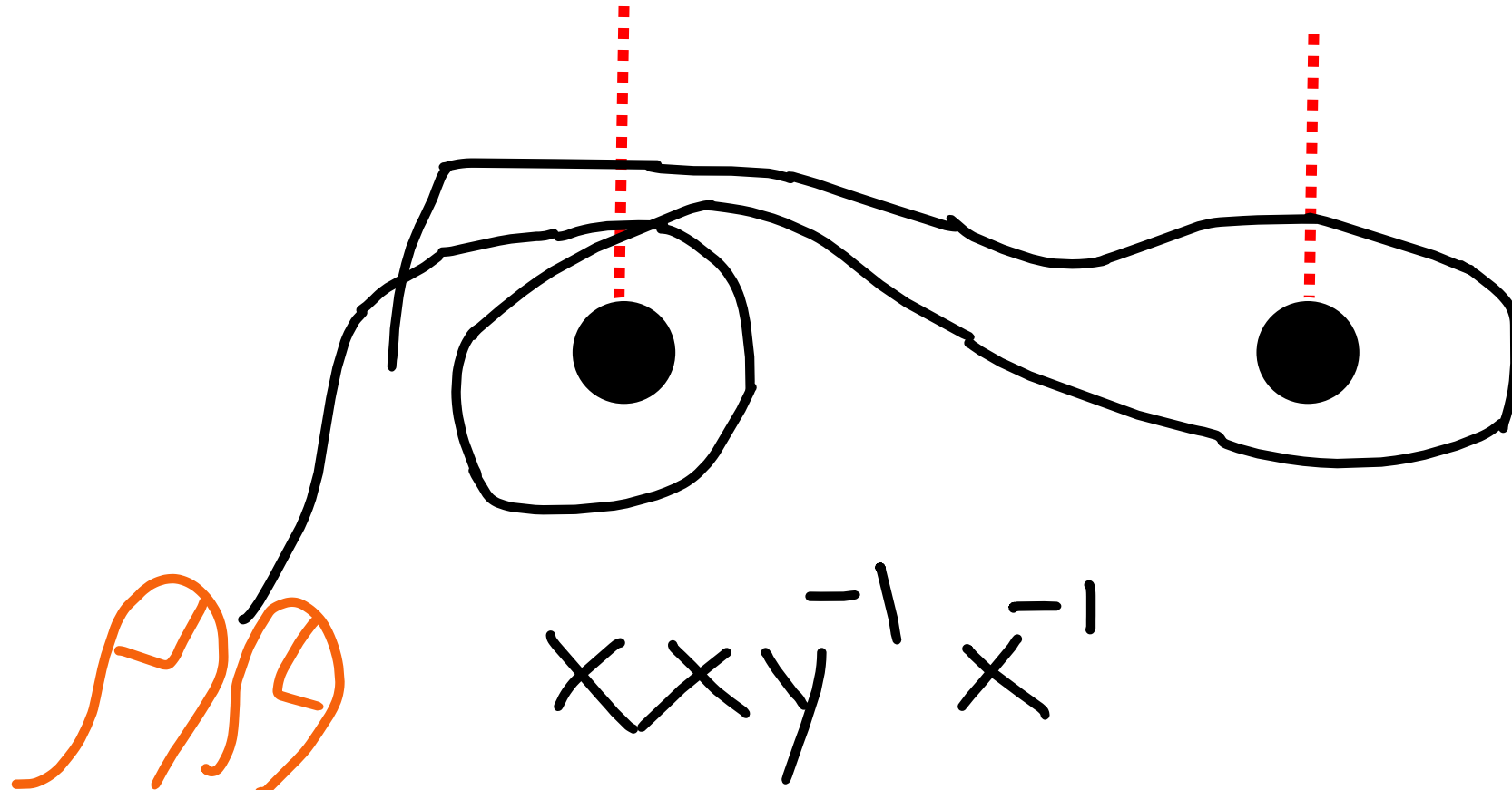


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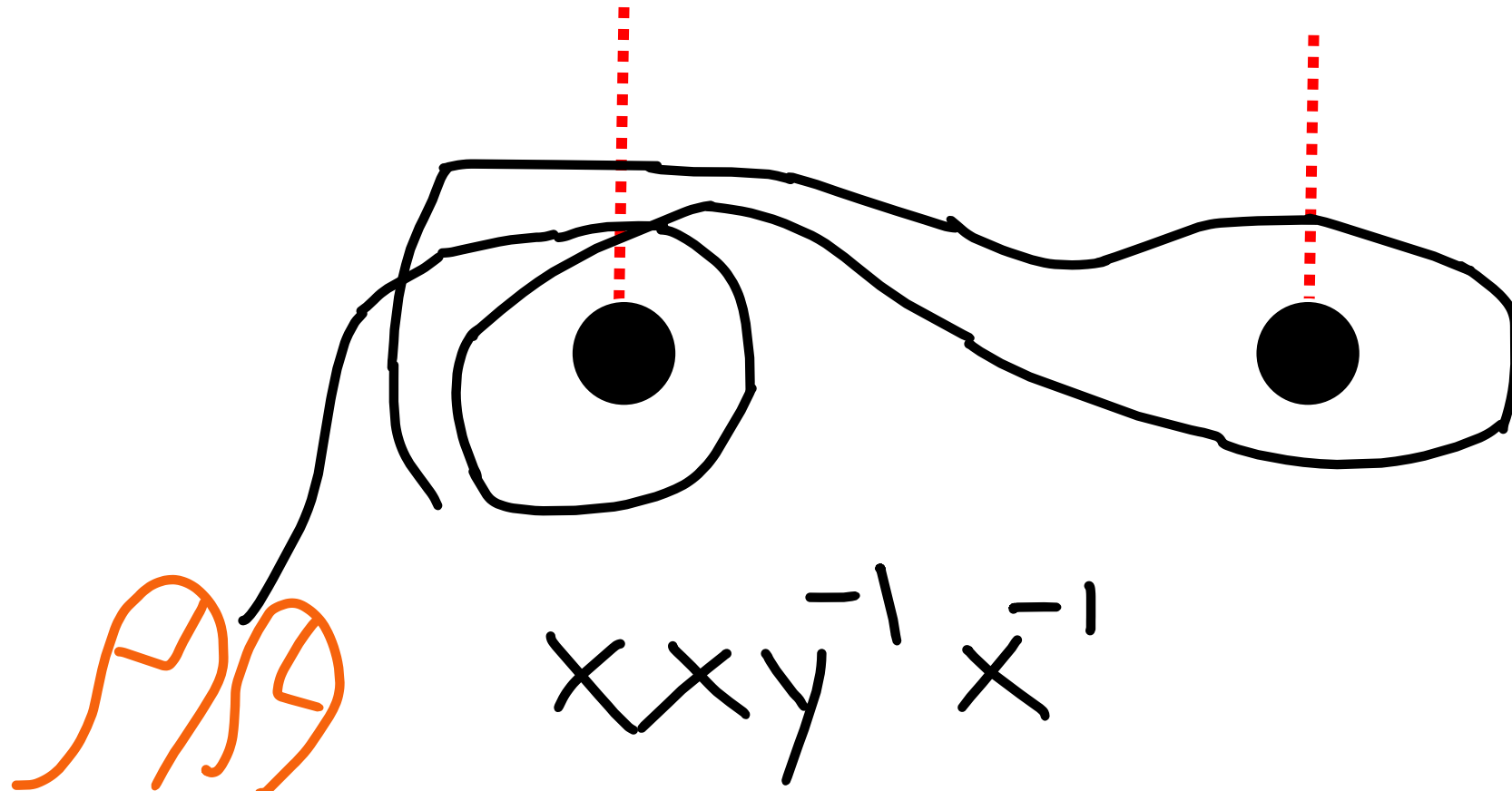


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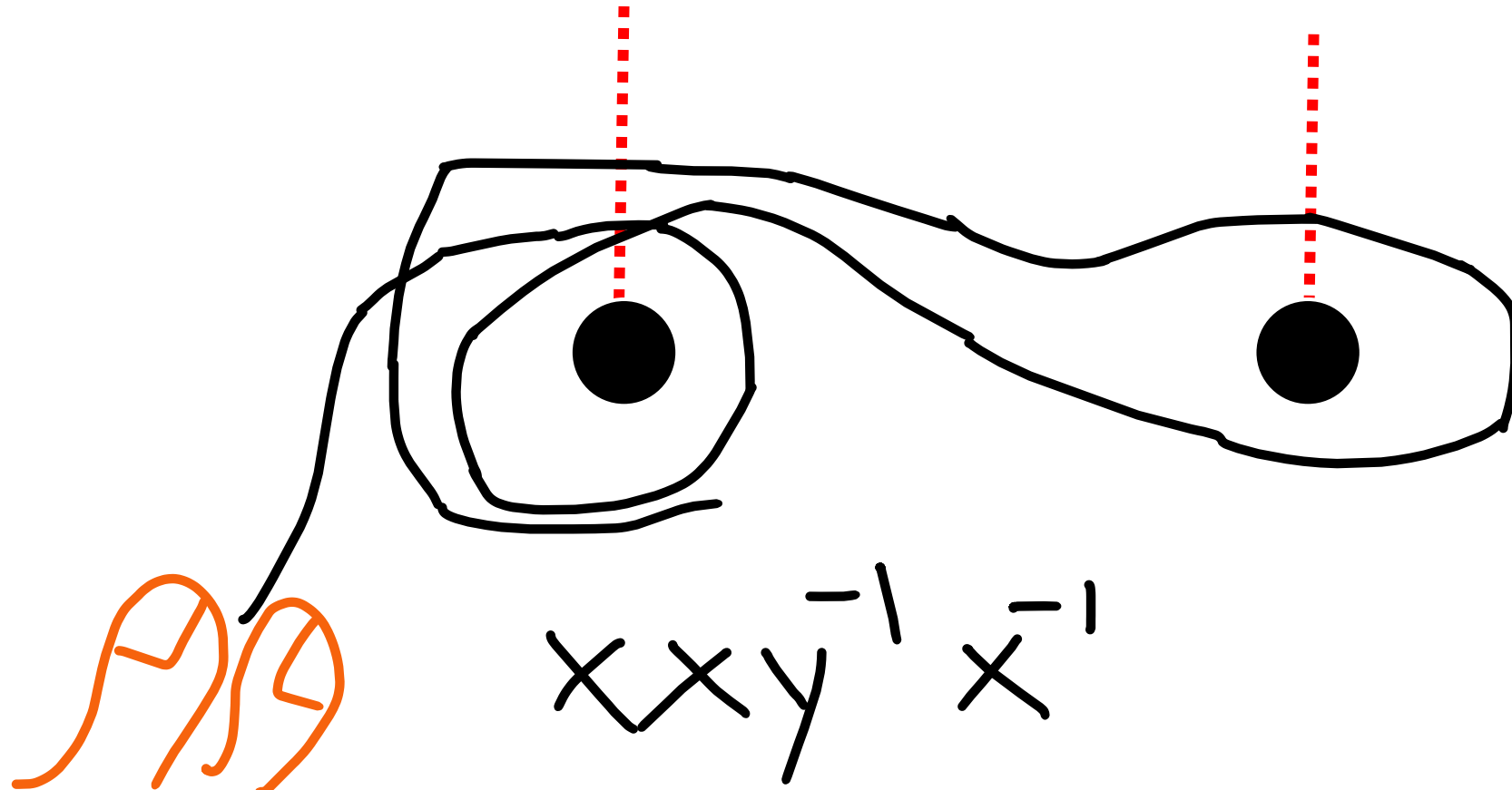


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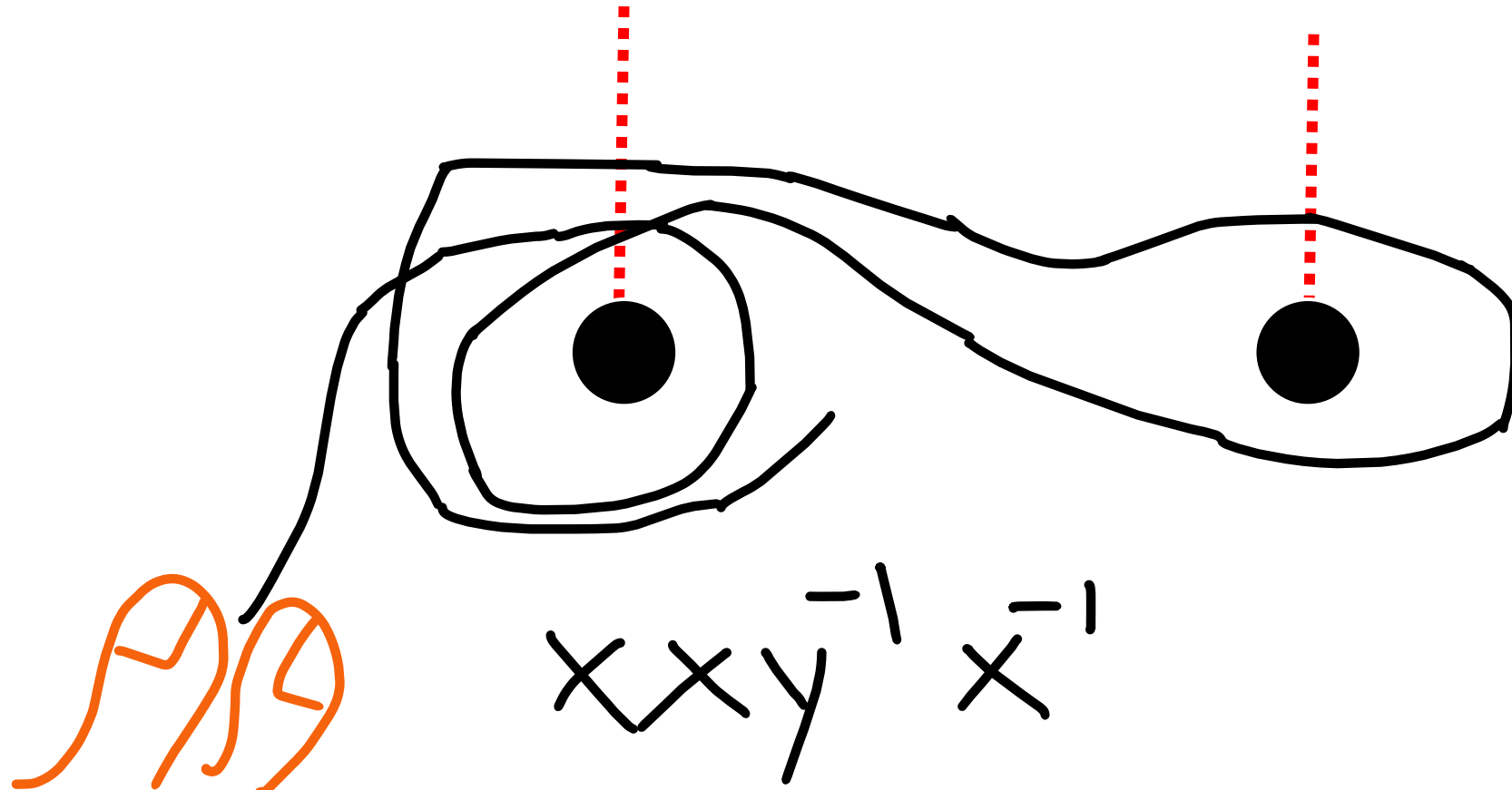


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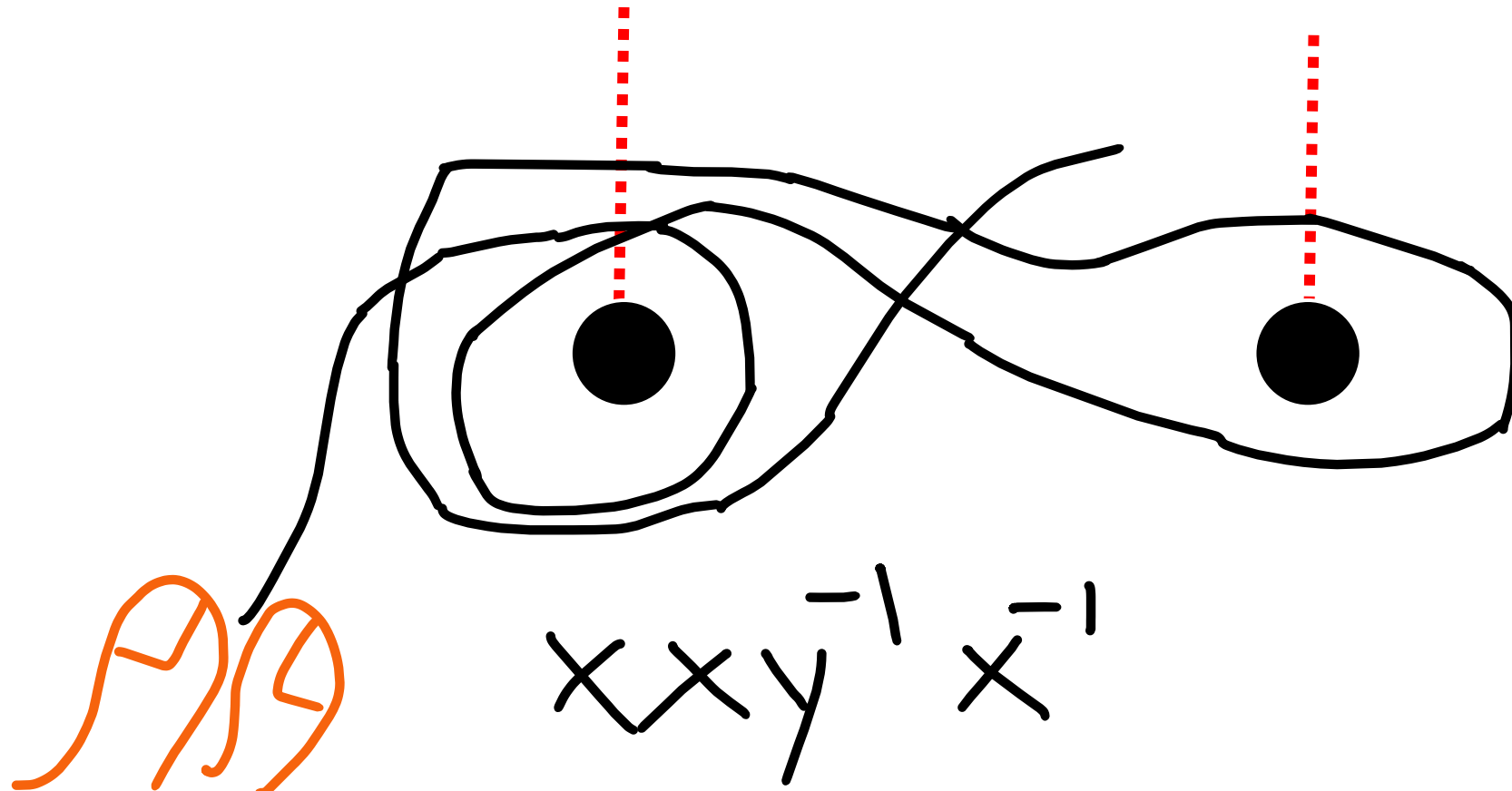


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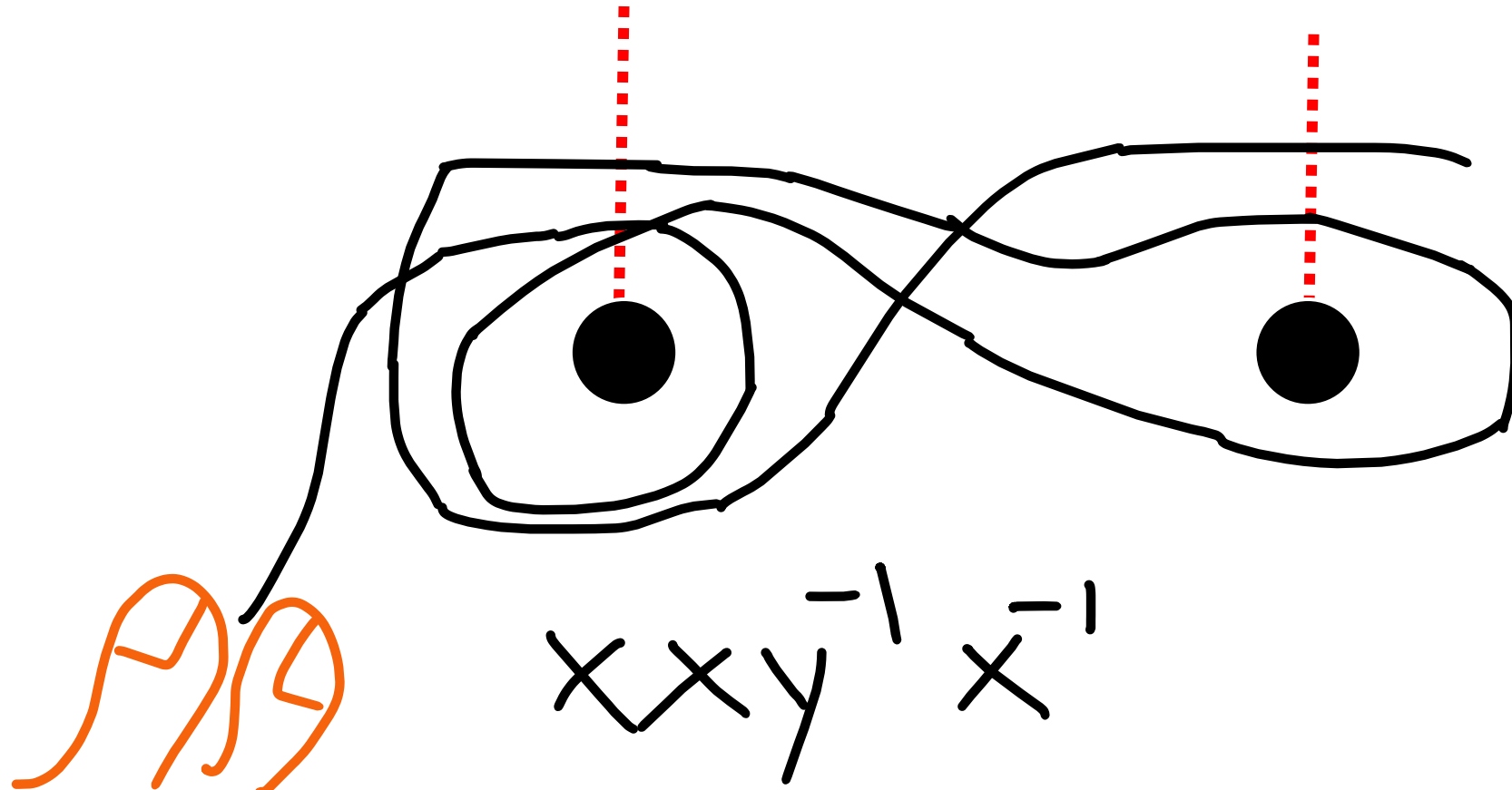


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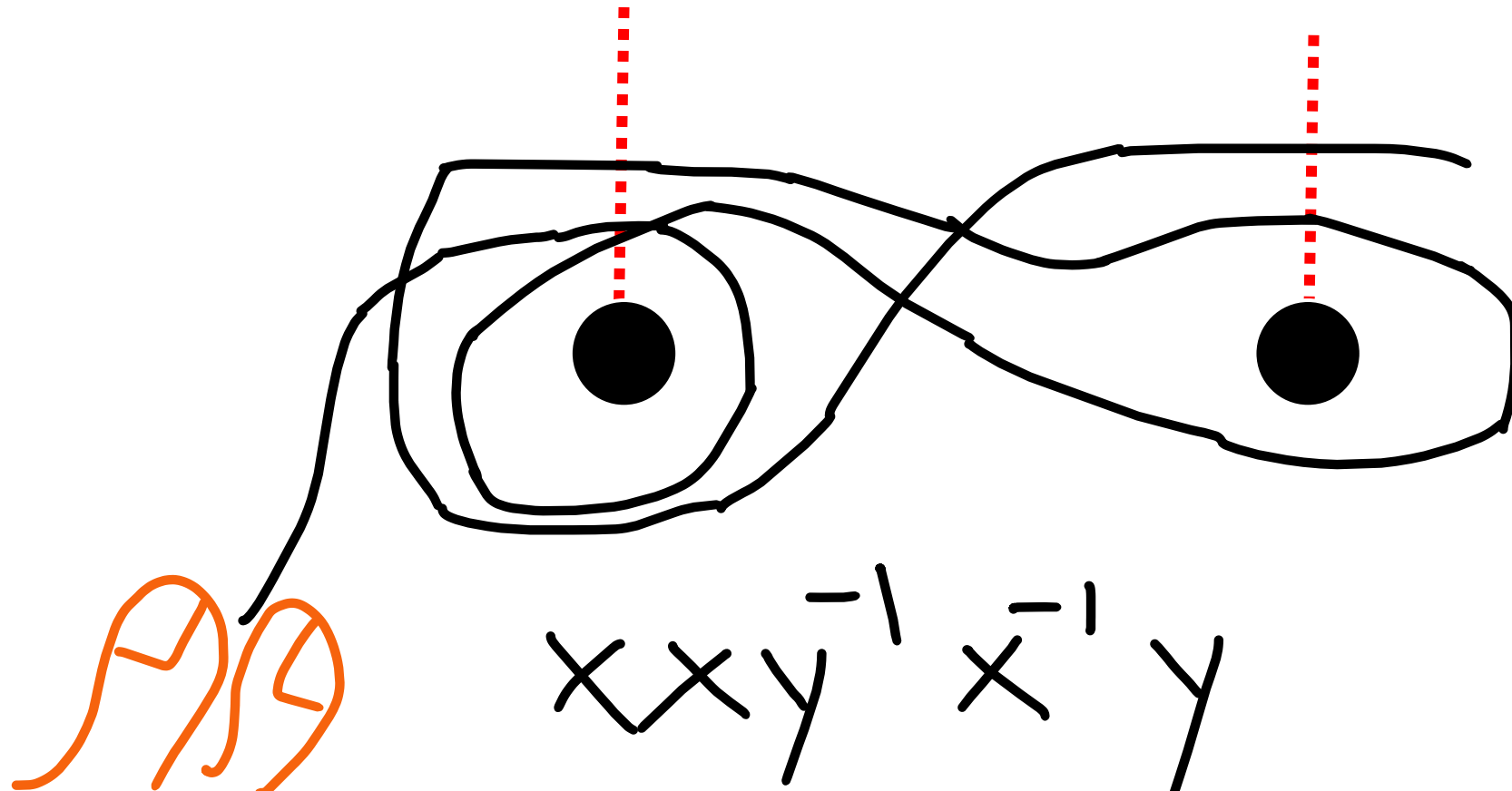


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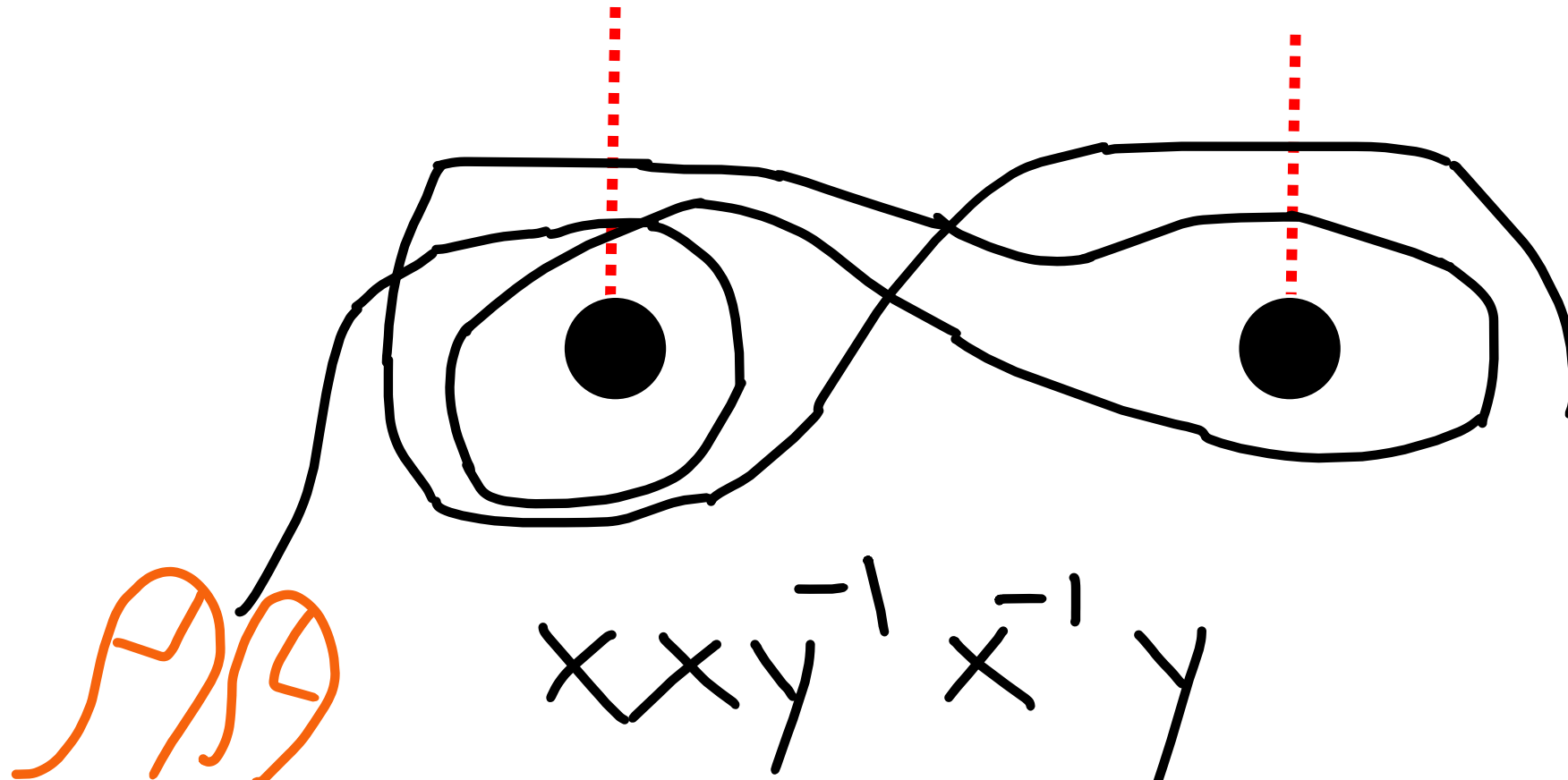
$xx^{-1}y^{-1}x^{-1}y$

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}



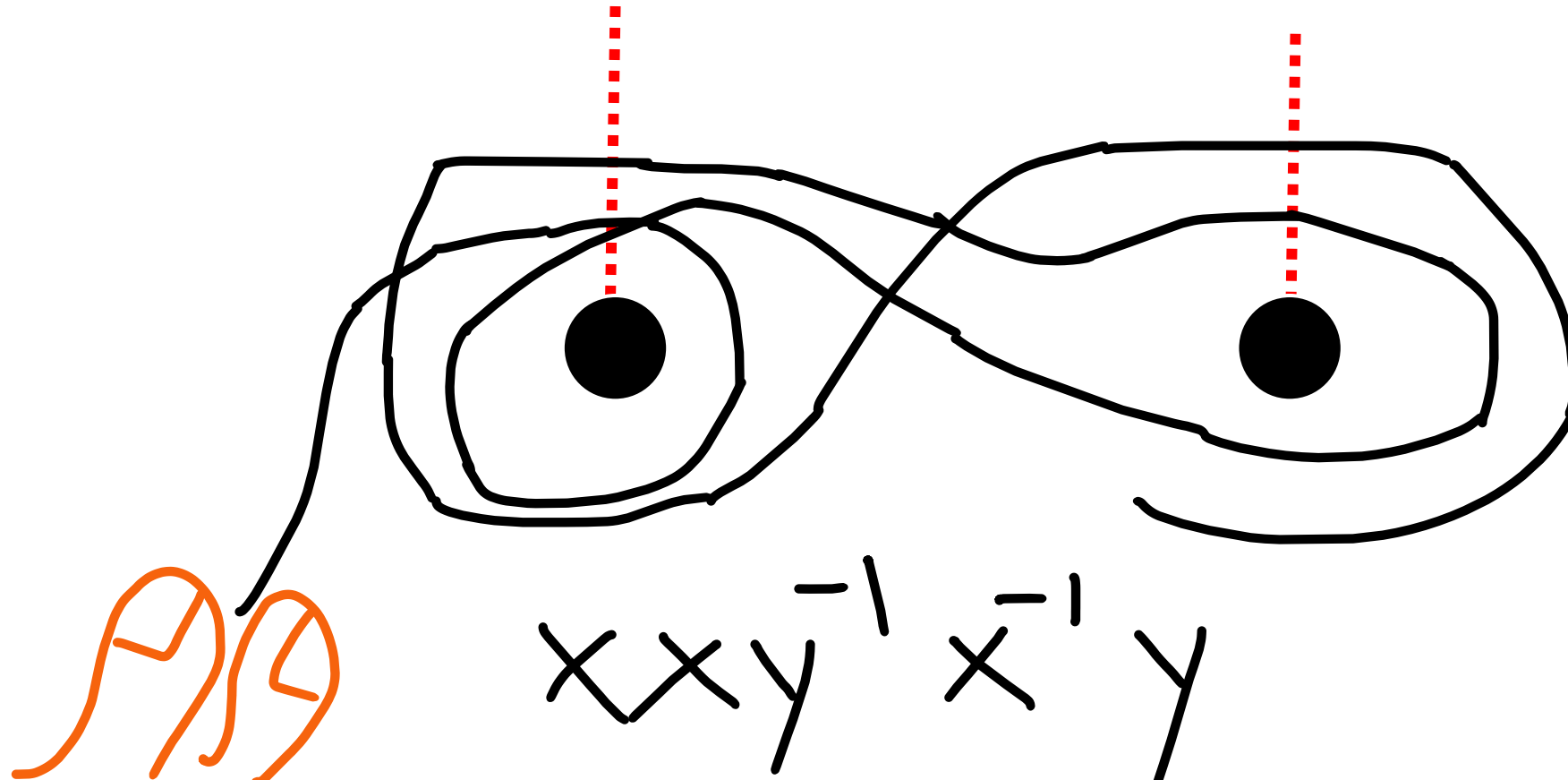
$xx\bar{y}^{-1}\bar{x}^{-1}y$

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}



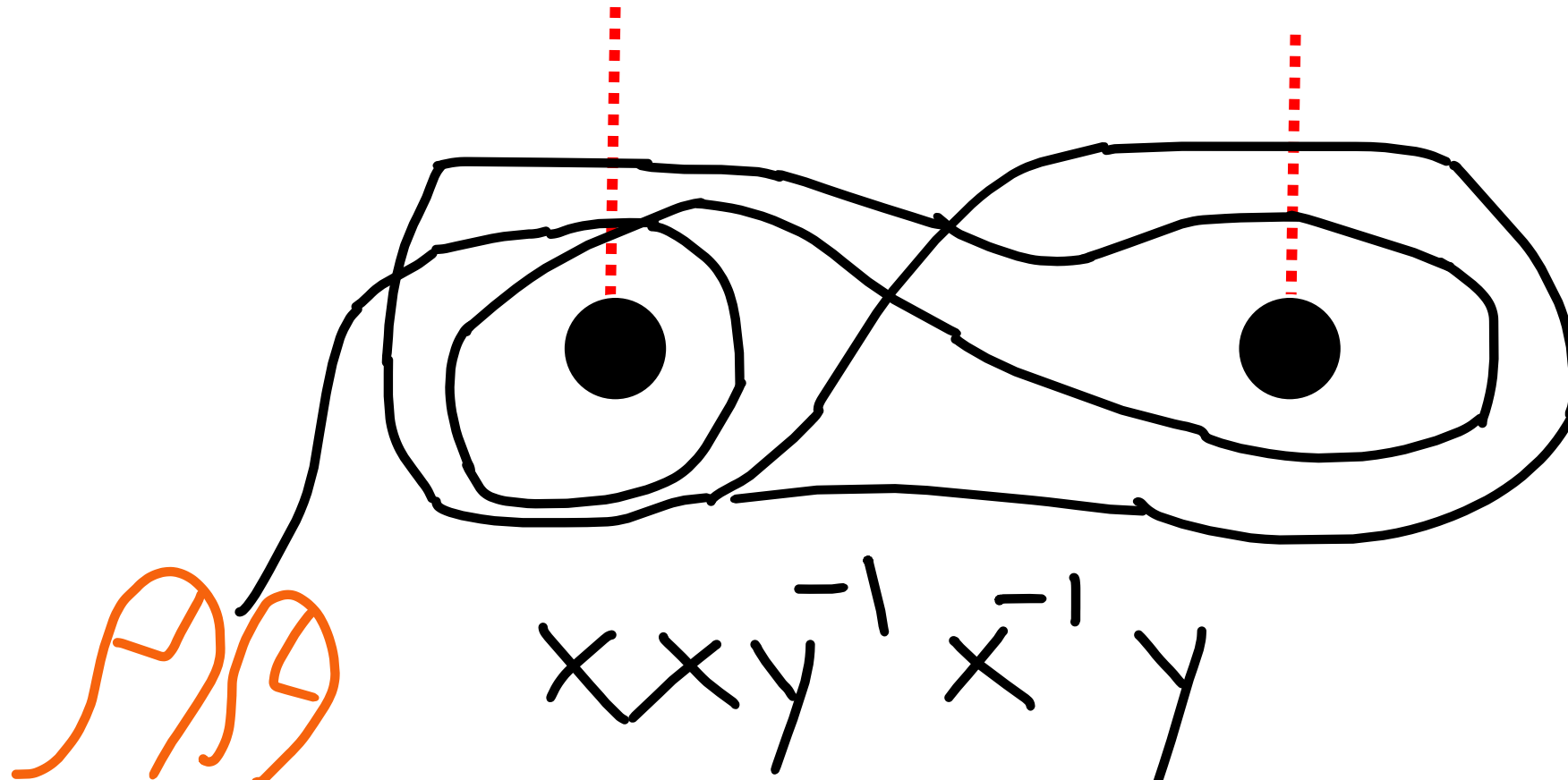
$xx^{-1}y^{-1}xy$

Cross over left nail clockwise: write x

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

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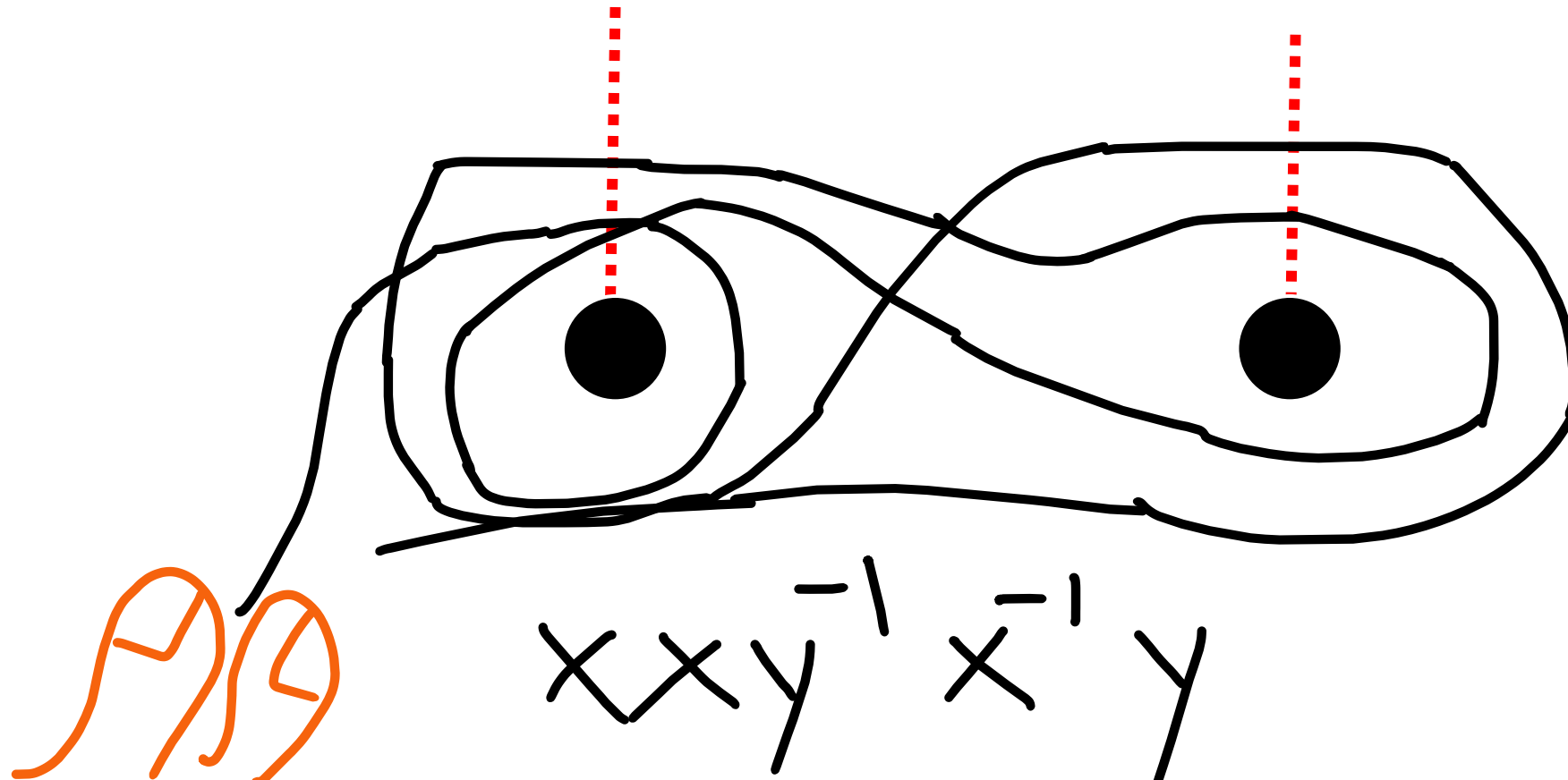


Cross over left nail clockwise: write x

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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}

