# Educational Use of KeTCindy and KeTCindyJS

Setsuo Takato

Toho University,Japan

2019.06.19 Toho Seminar

# KETpic

- KETpic is a plug-in for some mathematical softwares to produce figures of LaTeX.
- It works as a kind of preprocessor of LaTeX graphical code system 'tpic'.
- We started to develop it in 2006 with the use of Maple as the software.
- We extended the softwares to Mathematica, Scilab and R.

# KETpic 2 KETCindy

- We invited Kortenkamp, a main developer of Cinderella which is a DGS, and had a meeting in 2014. KETCindy was born from the meeting.
- Cinderella (Cindy) supports 'CindyScript', a programming language easy for us to use, which distinguishes Cindy from other DGSs.
- Cindy works as a GUI of KETpic in KETCindy.

# Advantages of KETCindy

- Teachers can produce teaching materials with figures interacitively and more easily.
- They can use KETCindy not only for geometry but for various fields such as calculus, linear algebra, statistics and so on.
- We will show samples of KETCindy.

# How to install KETCindy

- CTAN(Comprehensive TEX Archive Network) has uploaded KETCindy to the site in 2018.

  CTAN is the authoritative place where TeX related material and software can be found for download.

- You can download the package of KETCindy directly from https://ctan.org/pkg/ketcindy.

- Follow 'readme' in the folder 'ketcindy(-master)'.

- **KeTCindyReference(E,J).pdf ( and iBook (J)) are provided.**

# KeTCindy page in CTAN

## ketcindy – Creating graphics for TeX using Cinderella

KeTCindy combines a plugin to Cinderella with free mathematical software (R, Maxima, ...) to produce high-quality LaTeX graphics.

Using Cinderella to generate graphics in an interactive environment, the generated image can be fine-tuned using KeTCindy commands embedded into CindyScript, the scripting language of Cinderella.

KeTCindy can be regarded as a prominent scheme to establish an effective linkage between visualization tools and editing tools. Moreover, KeTCindy enables the importation of data calculated or simulated using other mathematical software such as Maxima, Fricas, Risa/Asir and R, and to combine them with the graphical data, so that an extremely wide range of mathematical objects can be presented.

| | |
|---|---|
| Sources | /graphics/ketcindy |
| Documentation | README<br>Reference manual (English)<br>Reference manual (Japanese)<br>User guide (English)<br>User guide (Japanese) |
| Home page | http://ketpic.com |
| Support | https://github.com/ketpic/ketcindy/issues |
| Bug tracker | https://github.com/ketpic/ketcindy/issues |
| Repository | https://github.com/ketpic/ketcindy |
| Version | 20190320.0 |
| Licenses | GNU General Public License, version 3 or newer |
| Copyright | 2014–2019 Setsuo Takato |
| Maintainer | Setsuo Takato |
| TDS archive | ketcindy.tds.zip |
| Contained in | TeX Live as ketcindy<br>MiKTeX as ketcindy |
| Topics | Graphics<br>Math |

Download the contents of this package in one zip archive (19.1M).

## Community Comments

No comments on this package are available yet. You can be the first to rate this package!

Home page | Support | Bug tracker | Repository

## Announcements


- 2018-12-26 CTAN Update: ketcindy
- 2018-10-31 CTAN update: ketcindy
- 2018-06-18 New on CTAN: ketcindy

## Suggestions

Maybe you are interested in the following packages as well.

- mptrees: Probability trees with METAPOST
- tableauvariations: Variation tables in METAPOST
- pst-geometrictools: A PSTricks package to draw geome
- pst-eucl: Euclidian geometry with PSTricks

## Rating Summary

☆☆☆☆☆
⌀ 0 [No votes]
This package has not been rated yet. You can be the first on

## My Rating

Only registered and authenticated members may vote. Pleas

## Package Links

# Enhancement of KETCindy

- 'KeTslide' to produce slides for presentation with animations has been implemented.
- 'pict2e'/'TikZ' can be used as the graphical code.
- functions to call Maxima from KETCindyhas been supported.
- functions to use gcc for speed-up hidden line processing.

# Web cite of KeTCindy

- We have launched a web site for KeTCindy.

  Samples of KeTCindy

- You can find samples of KeTCindyJS there.
- We will continue to add more samples.

# Demonstrations

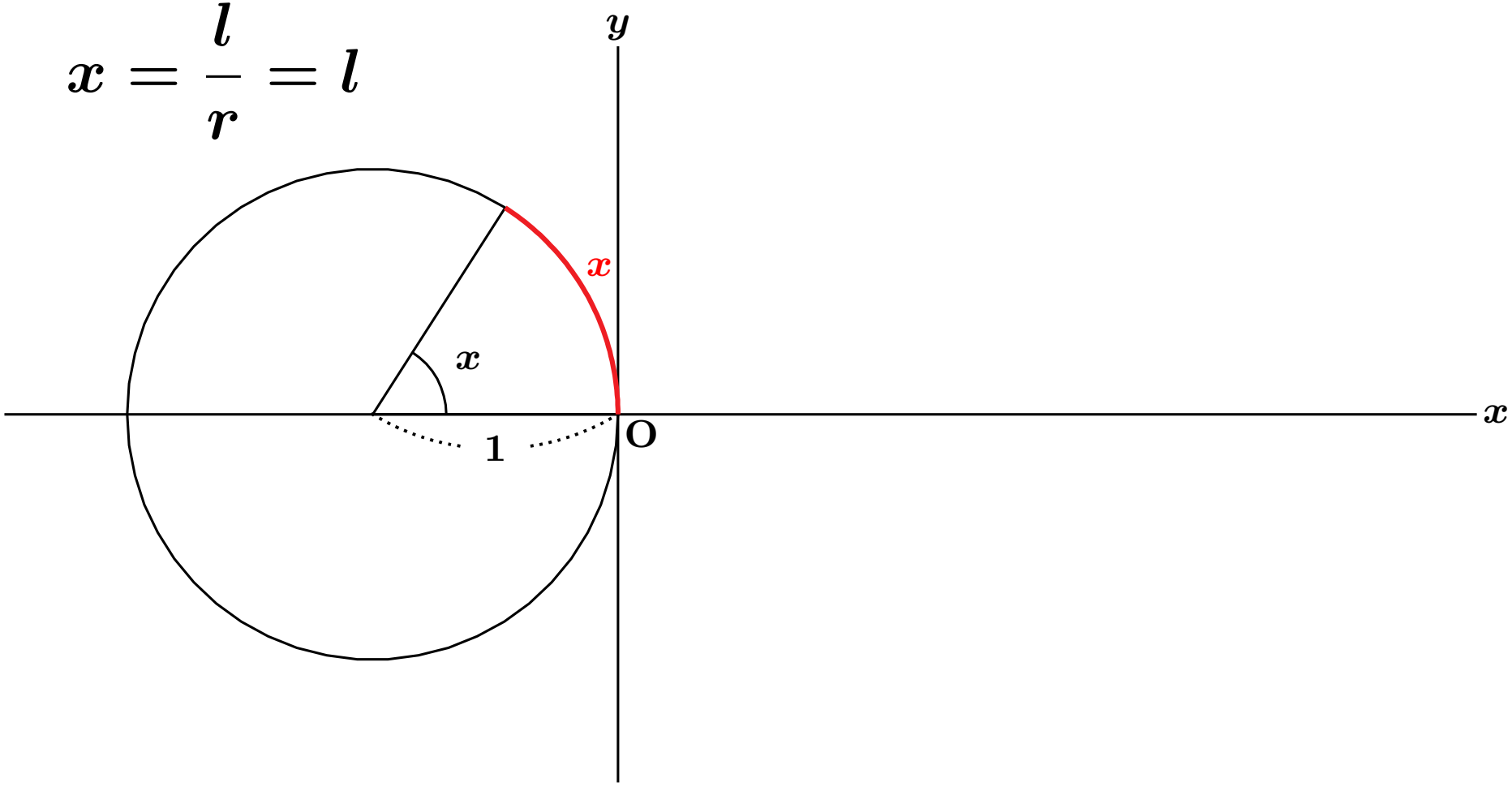
## Demomovie

# Use of KeTslide

- For math materials, expressions and proper figures are of fundamental importance.
- KeTslide can be handled easily, so will be suitable for usual mathematics teachers.
- Animations and flip animations are also available.

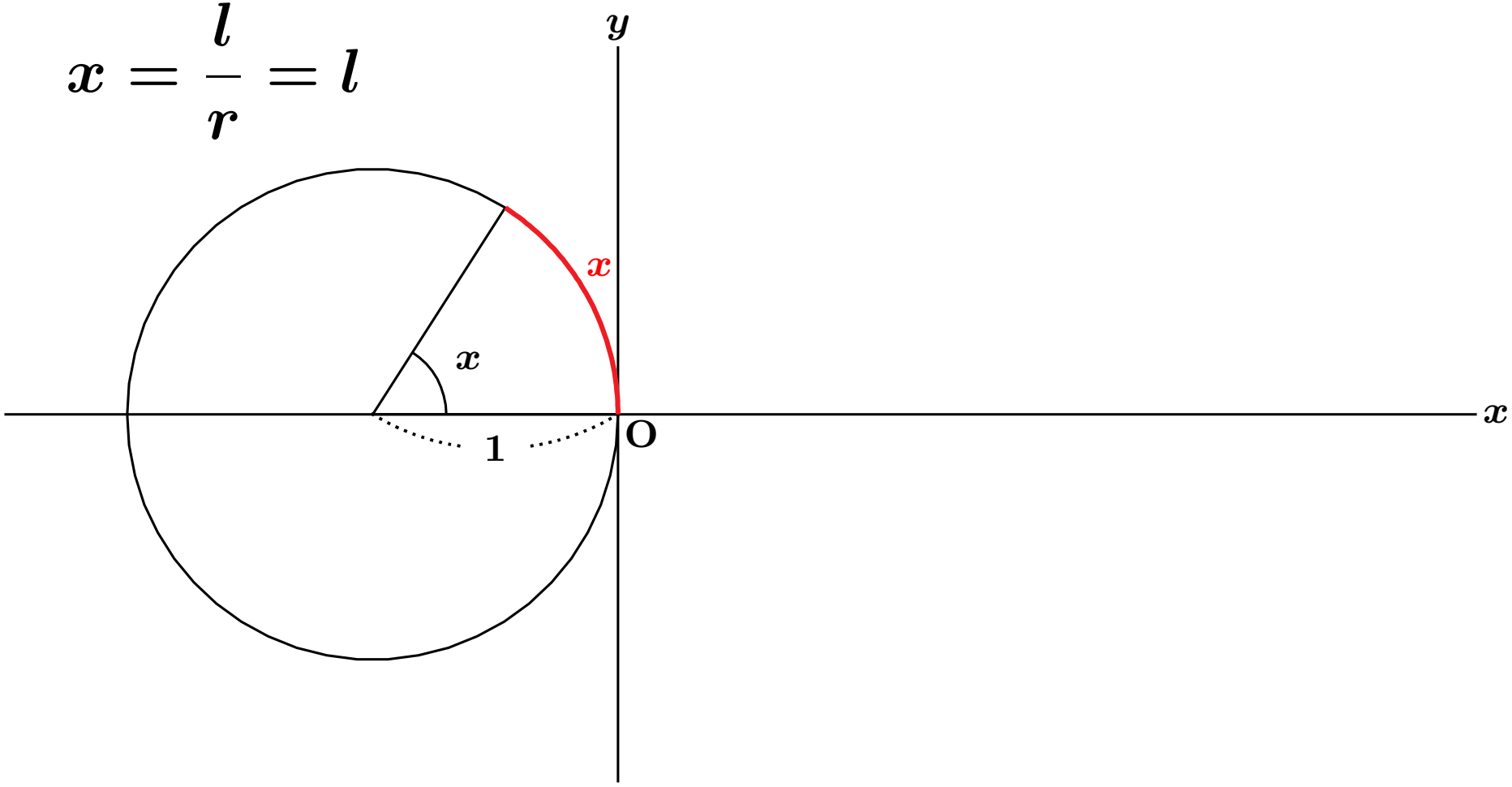
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



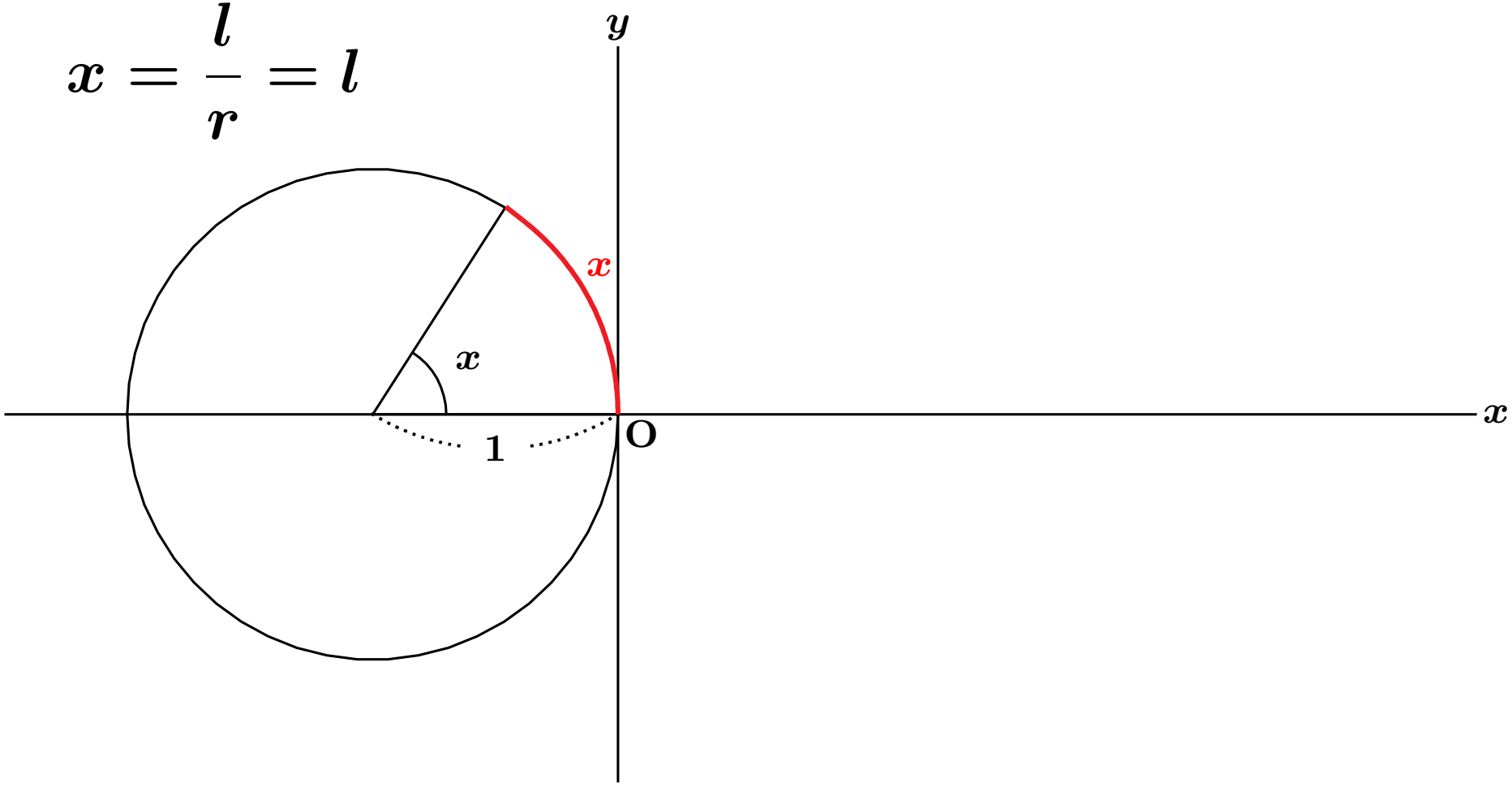
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



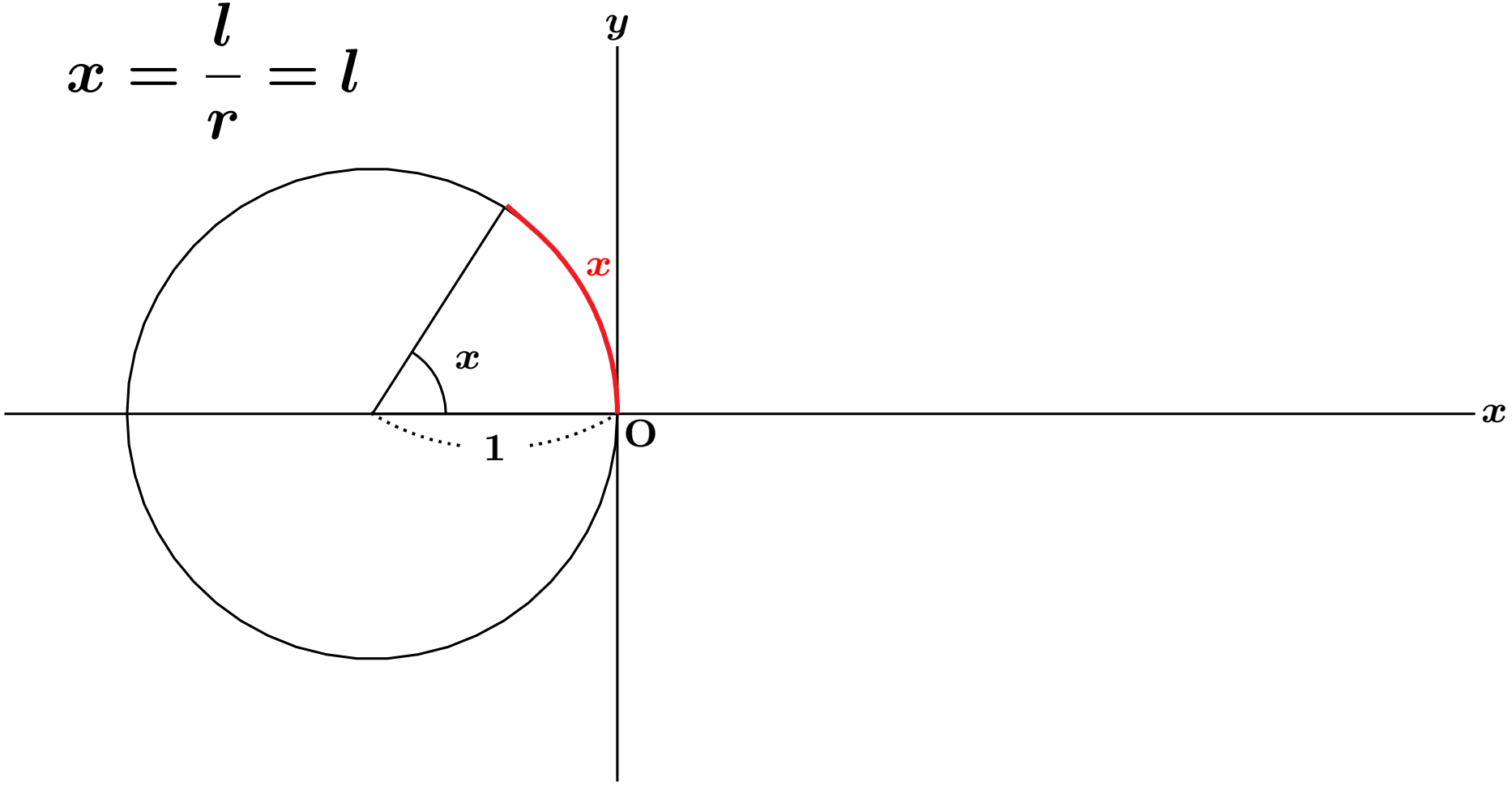
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



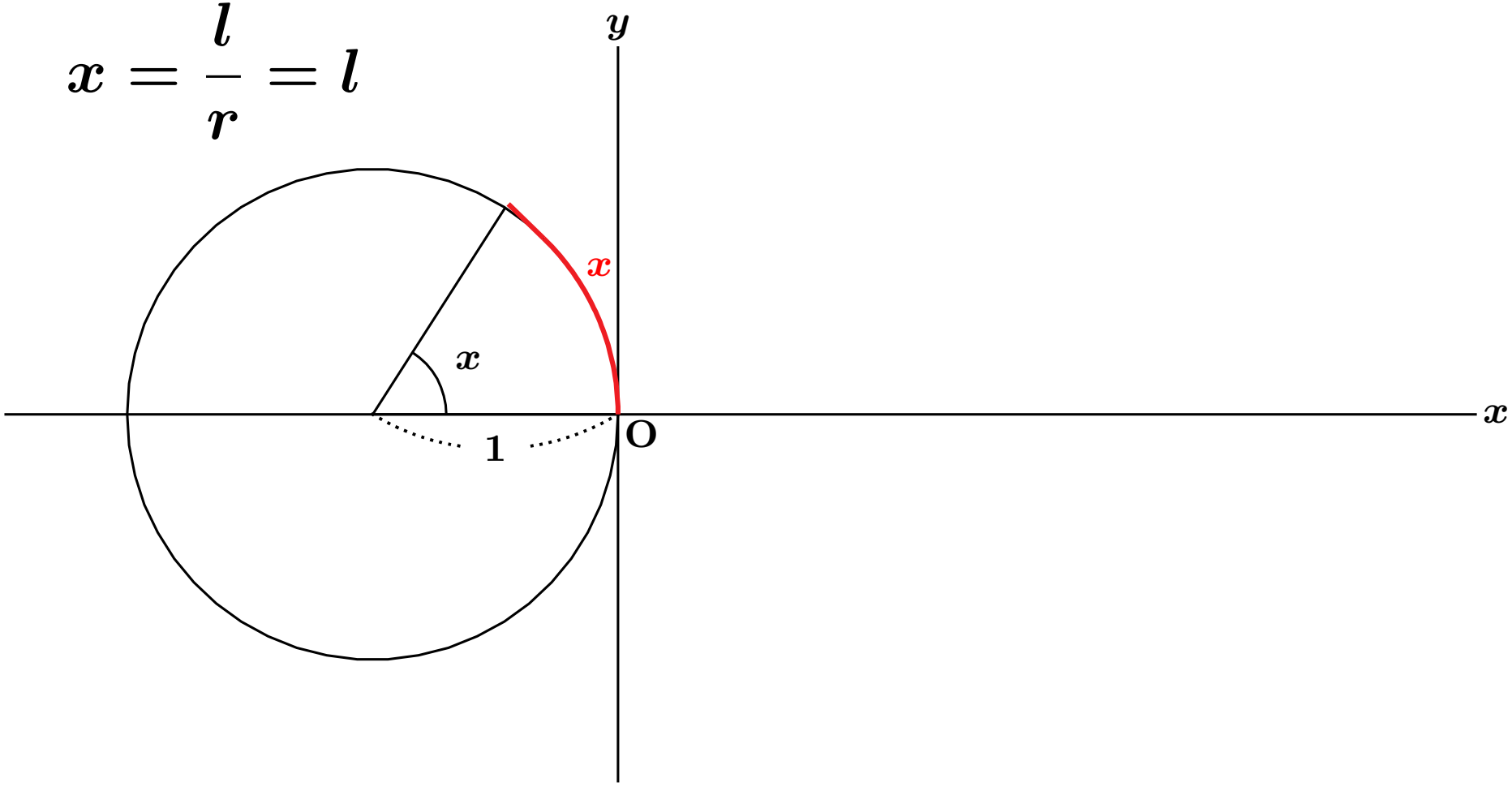
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



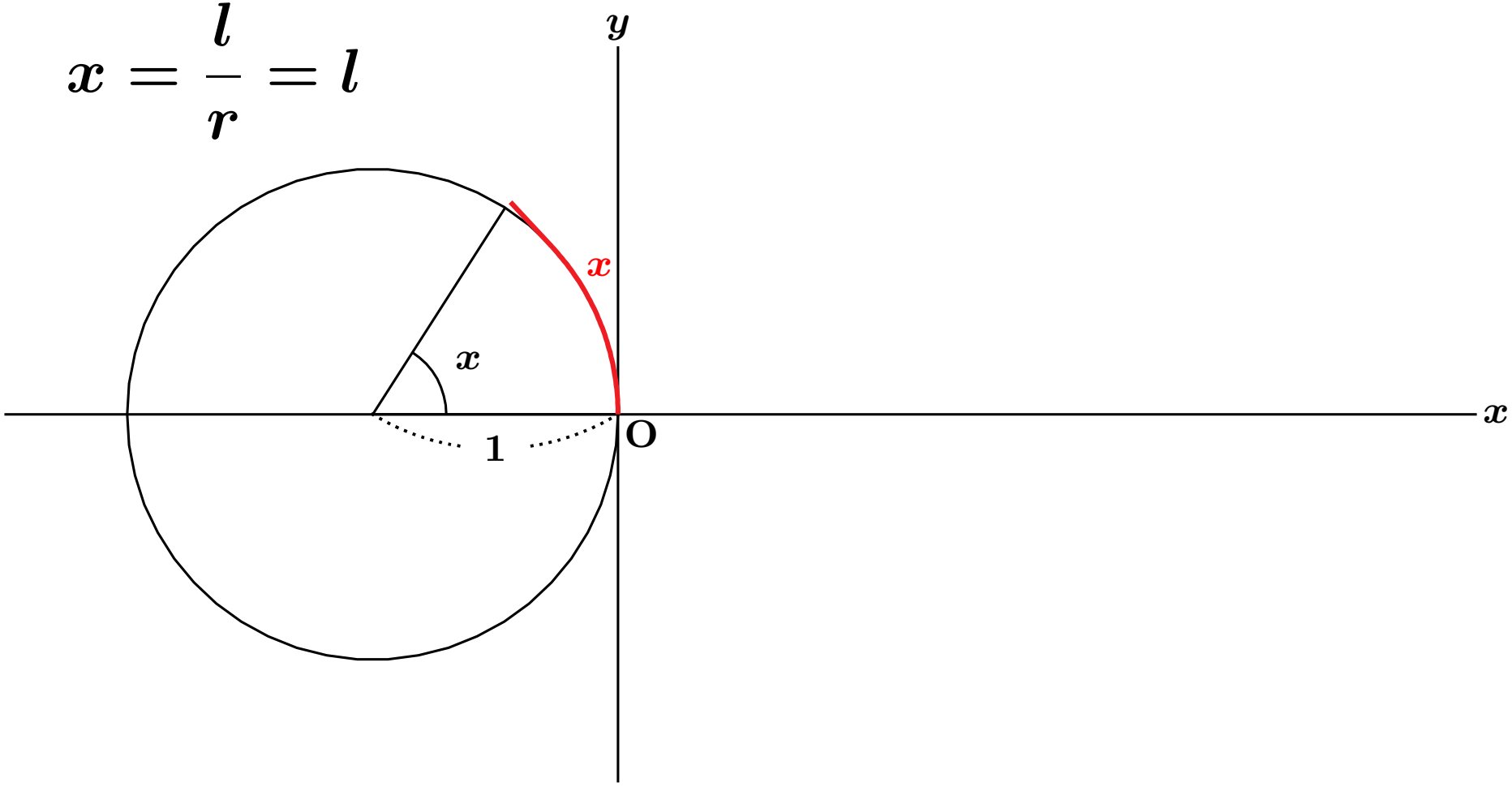
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



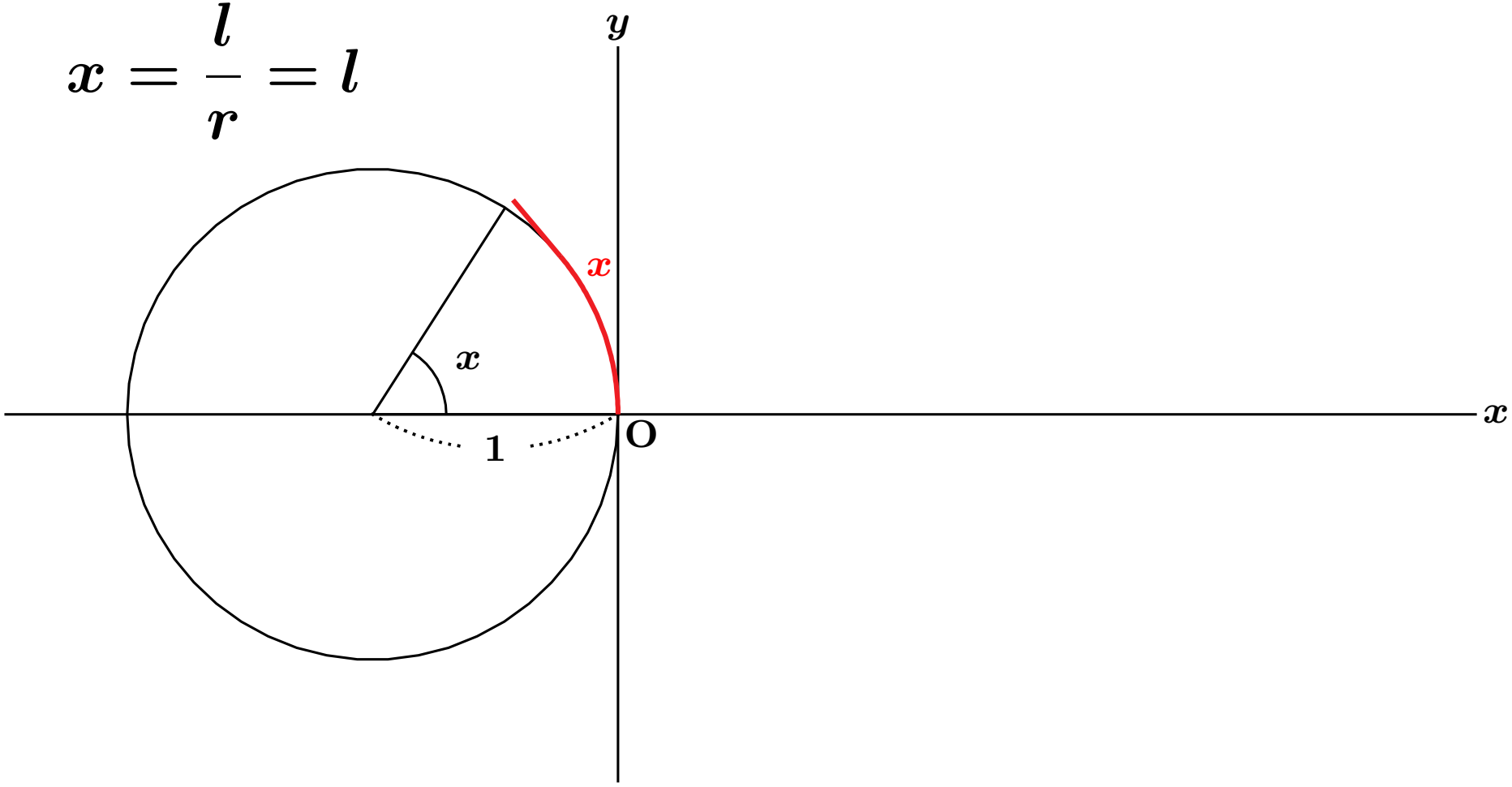
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



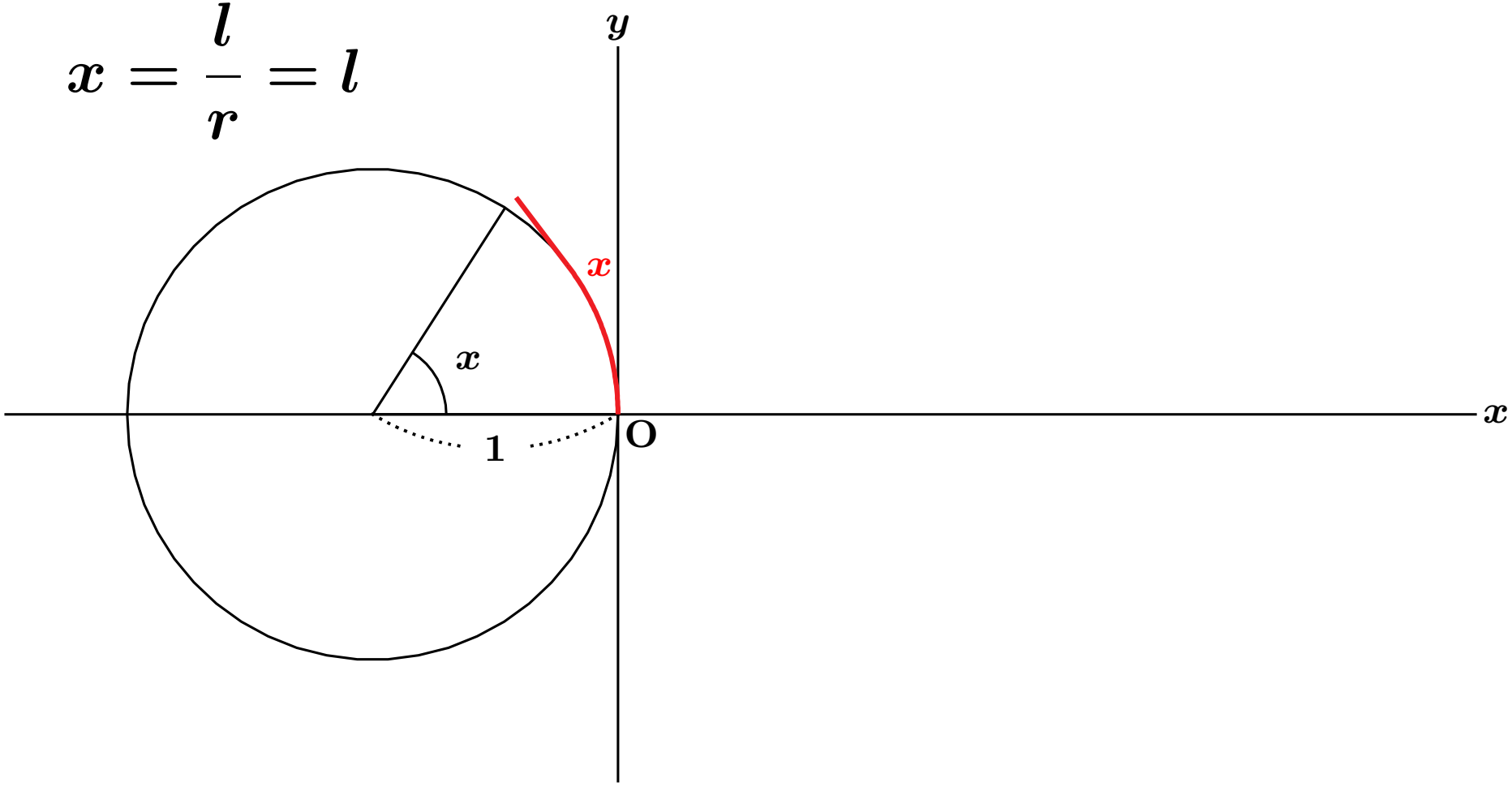
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



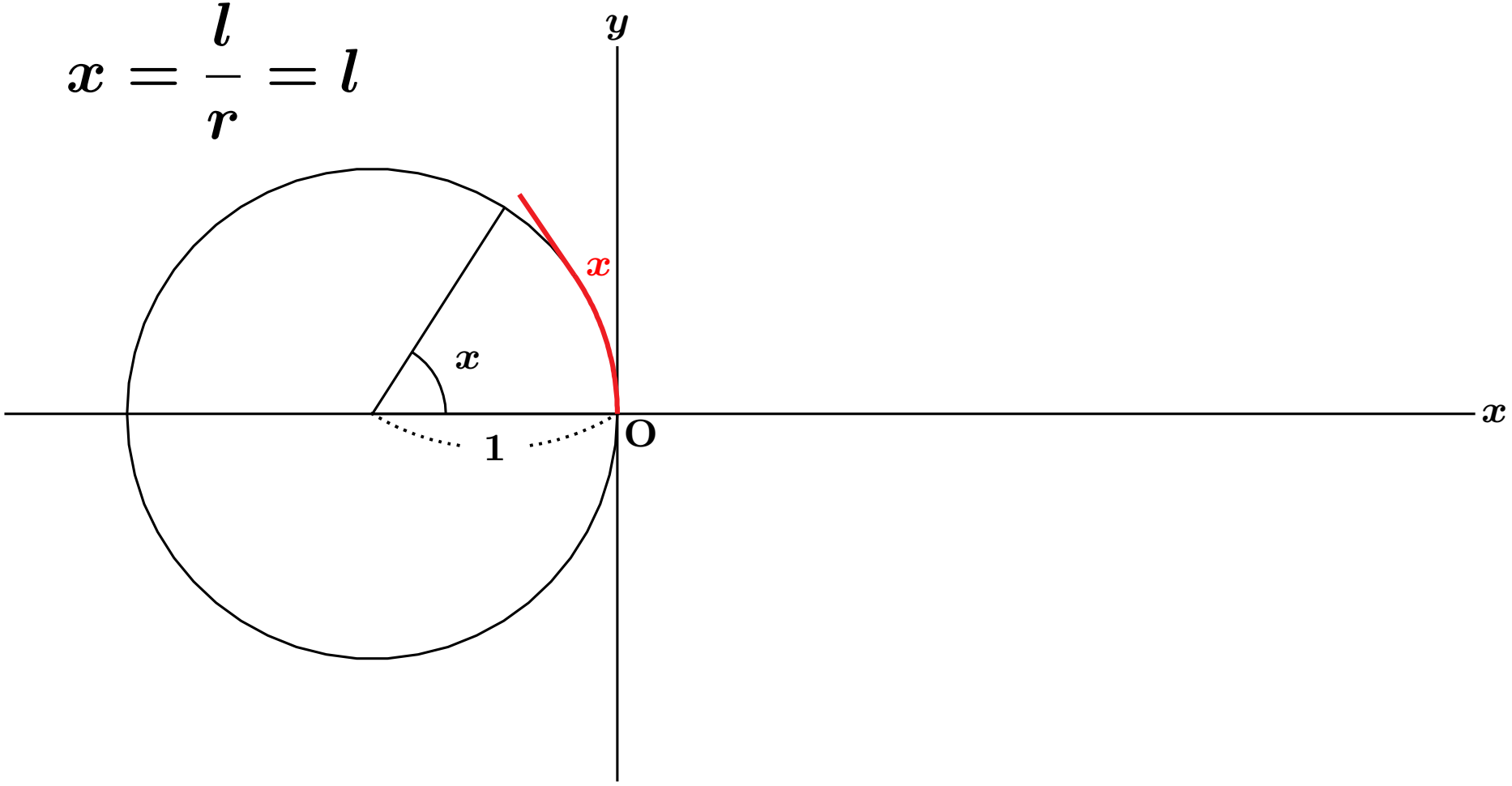
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



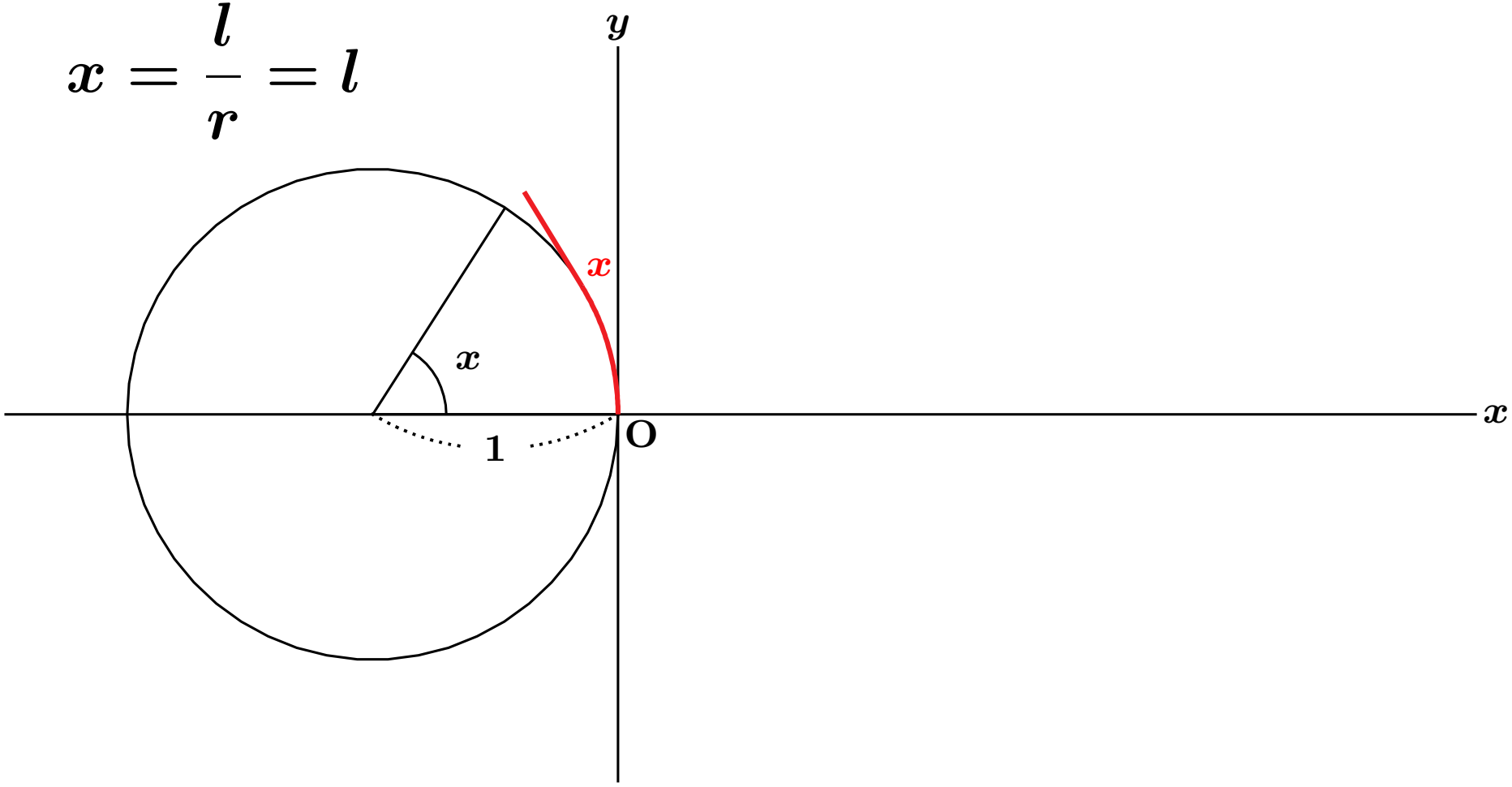
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



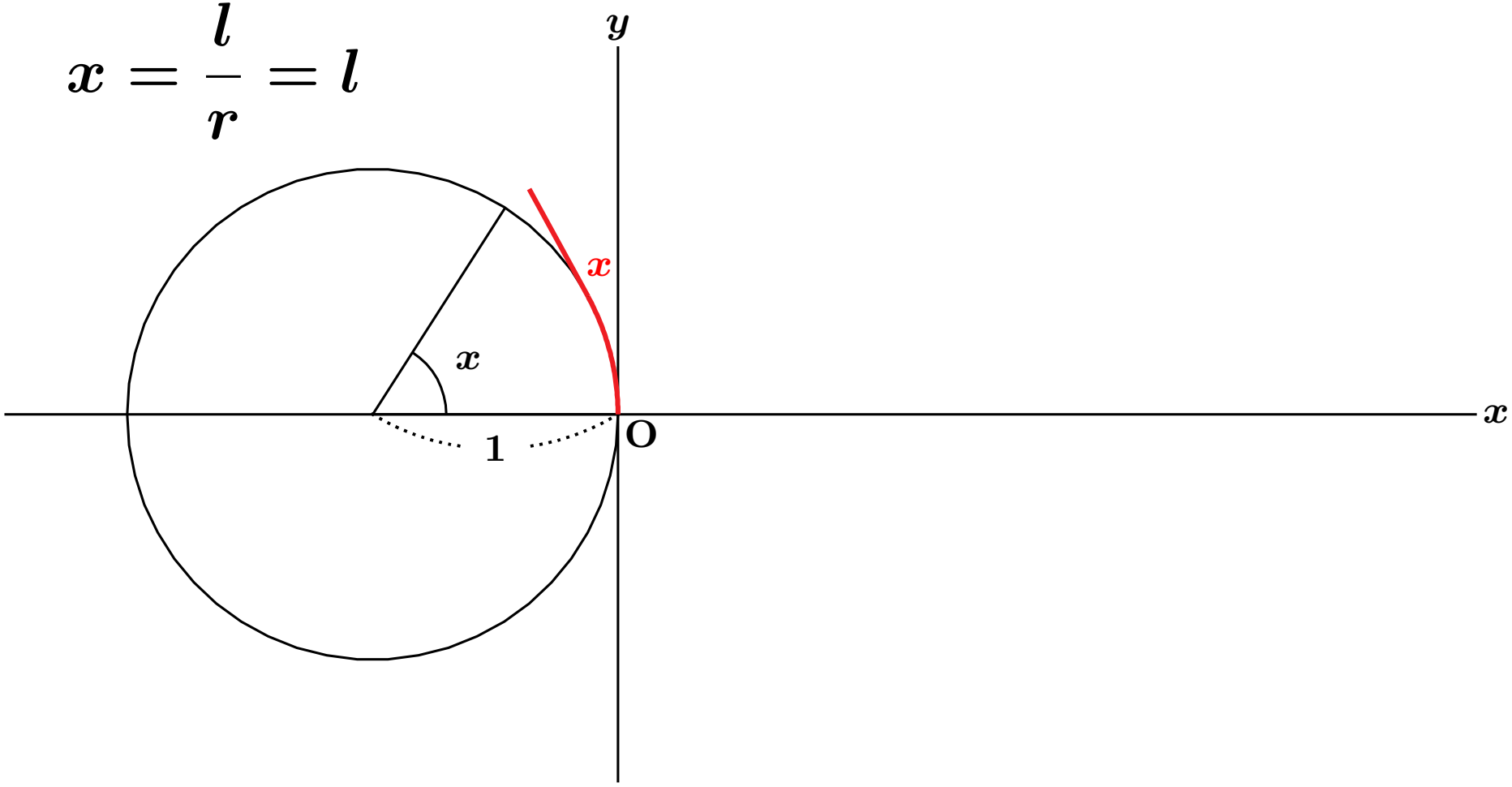
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



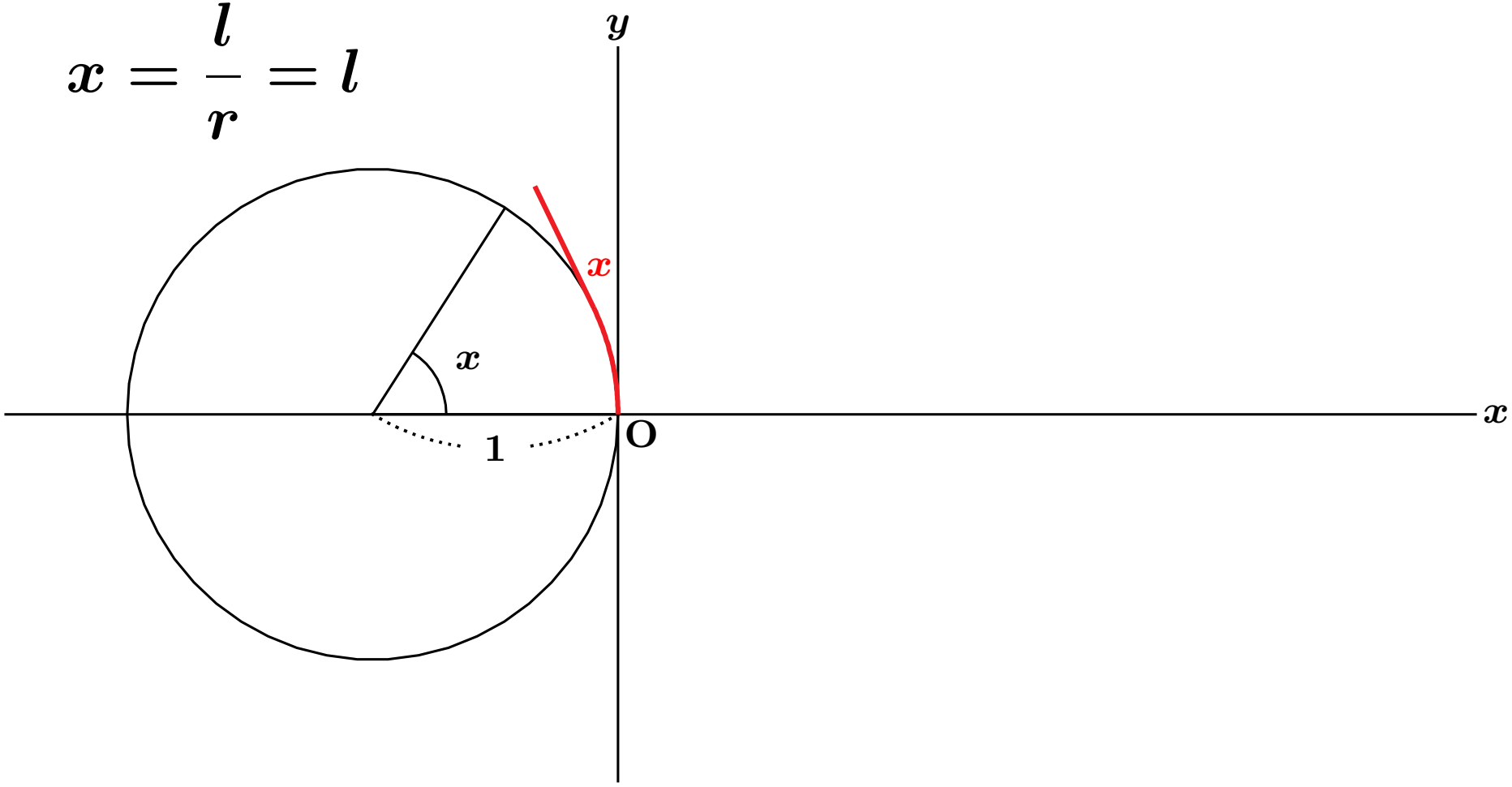
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



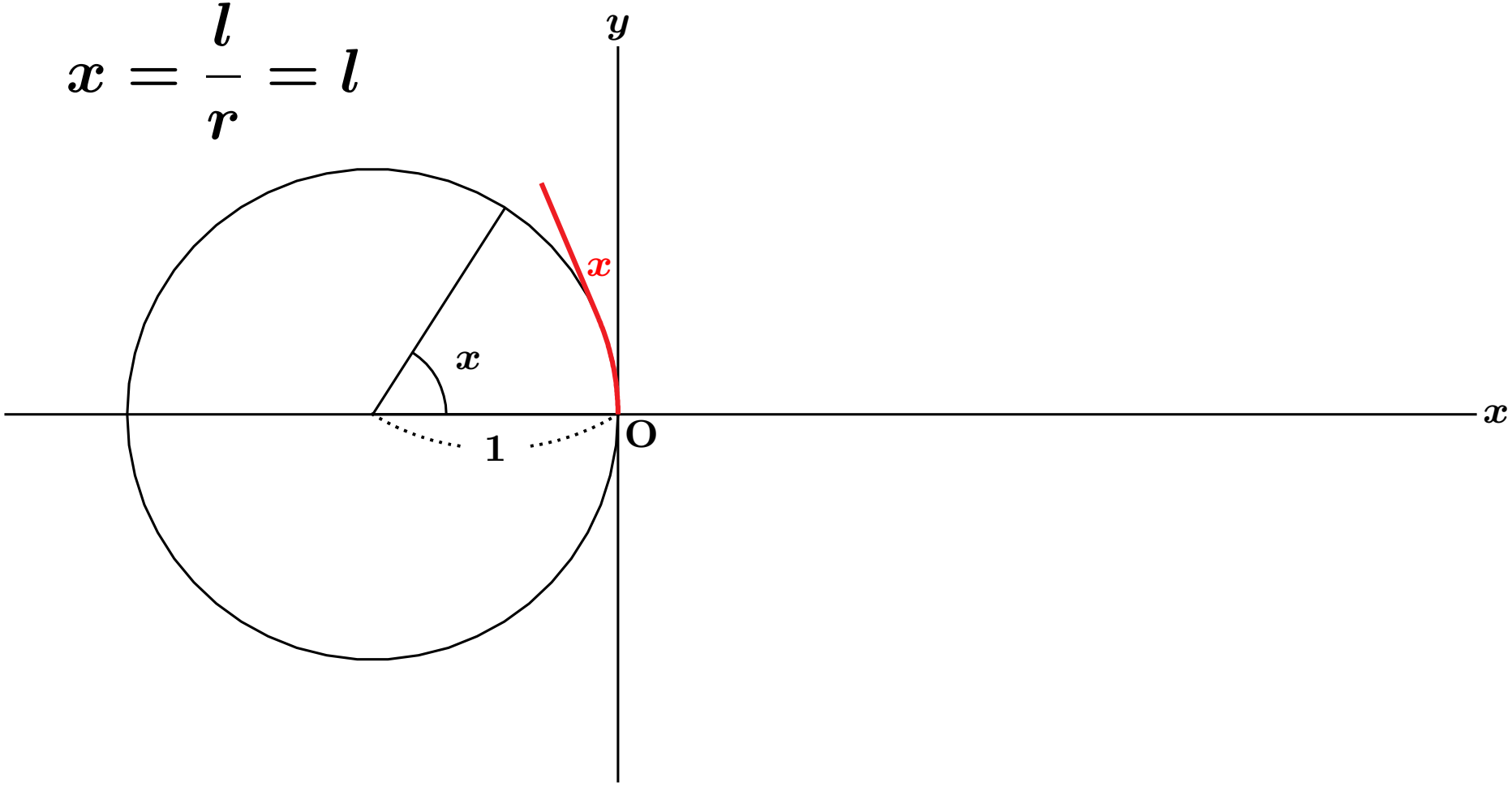
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



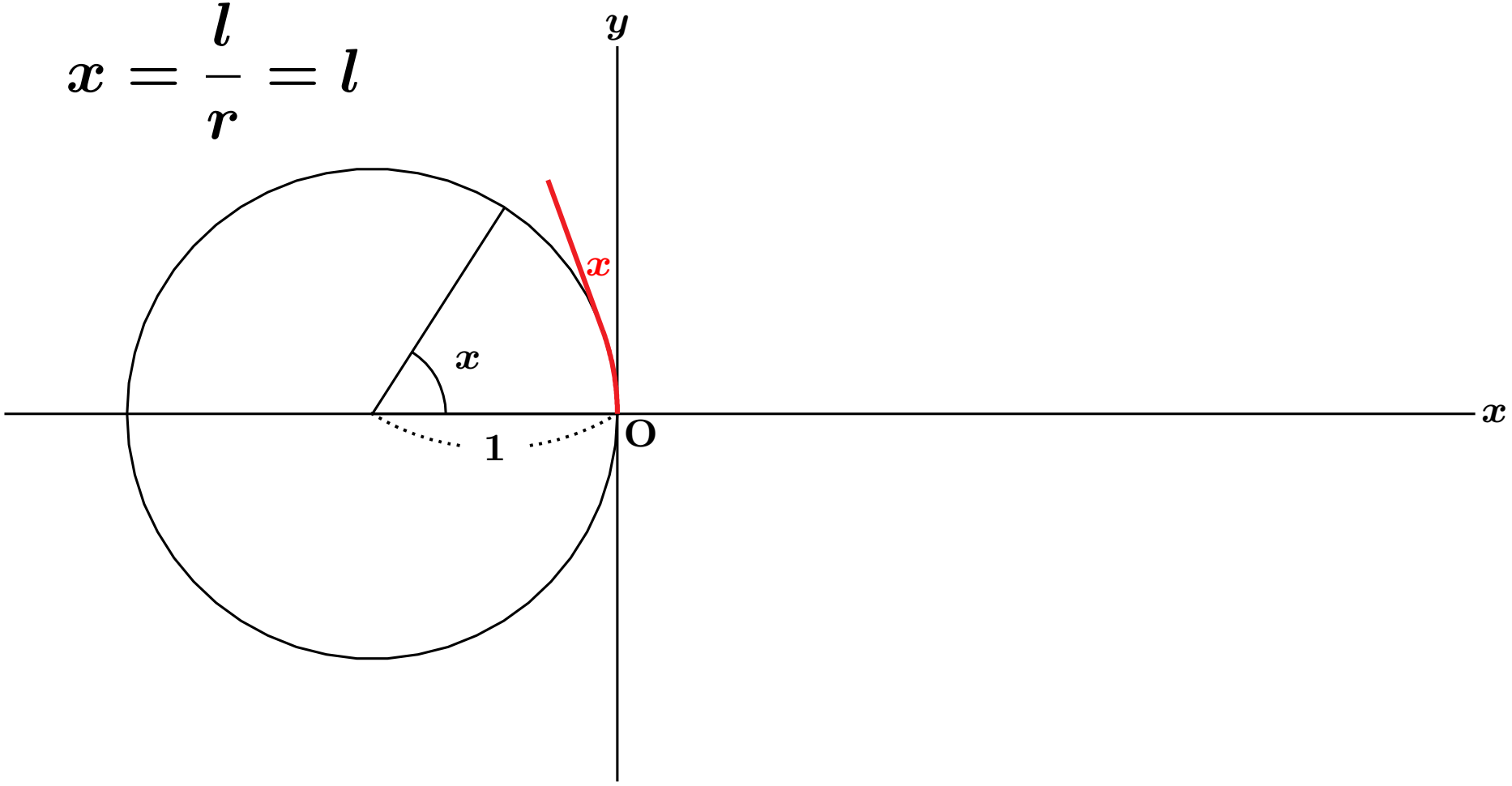
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



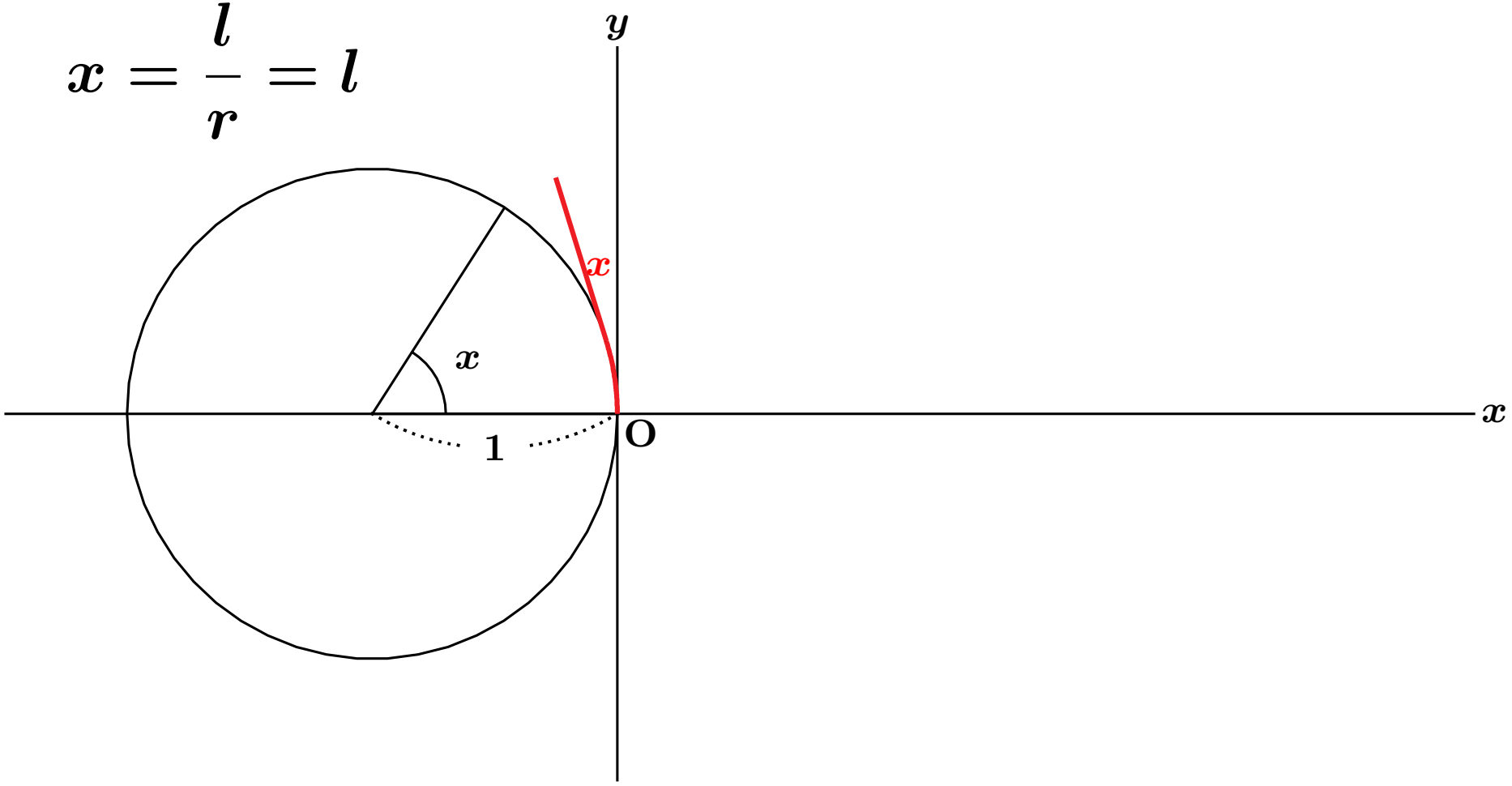
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



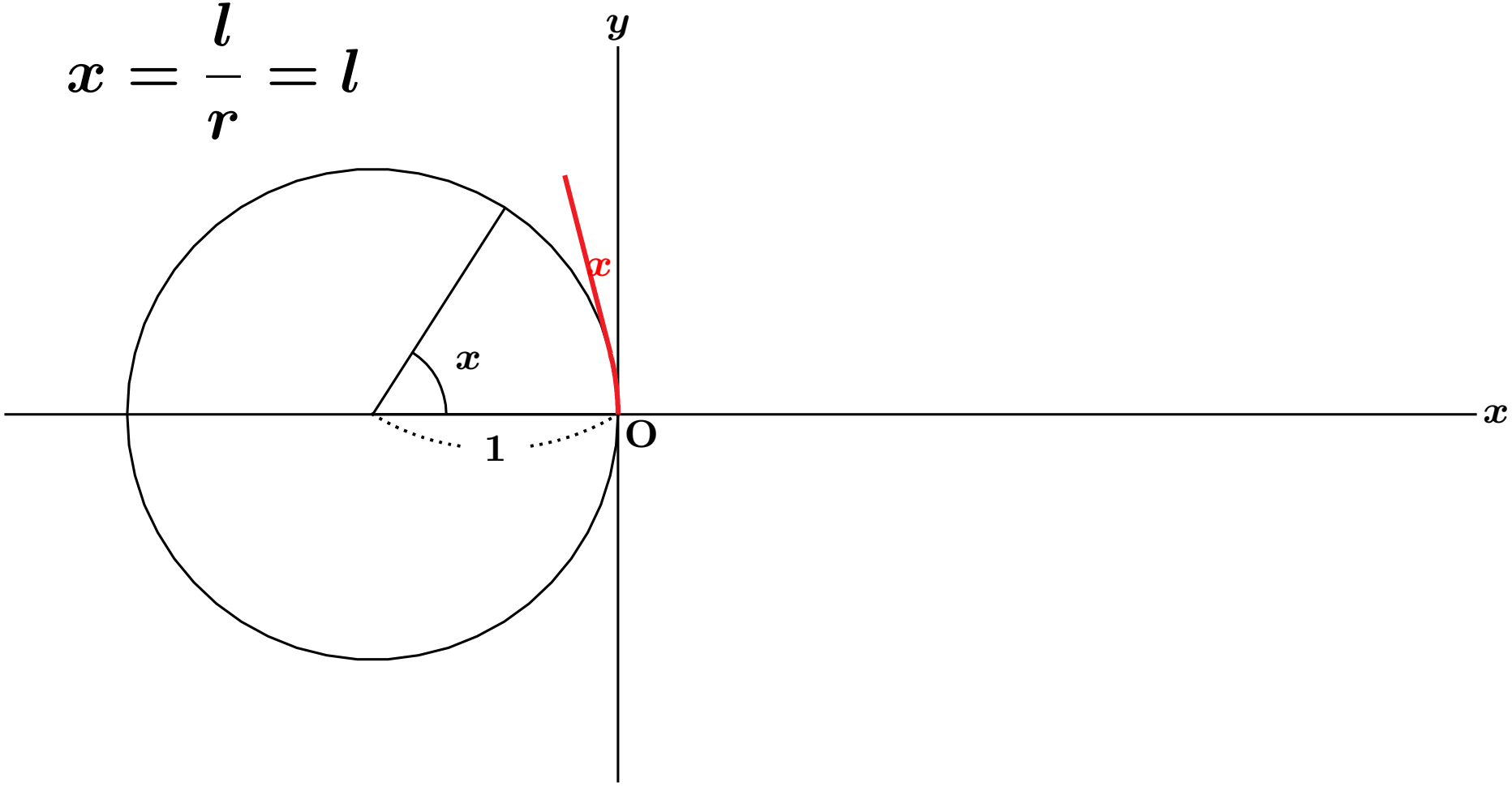
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



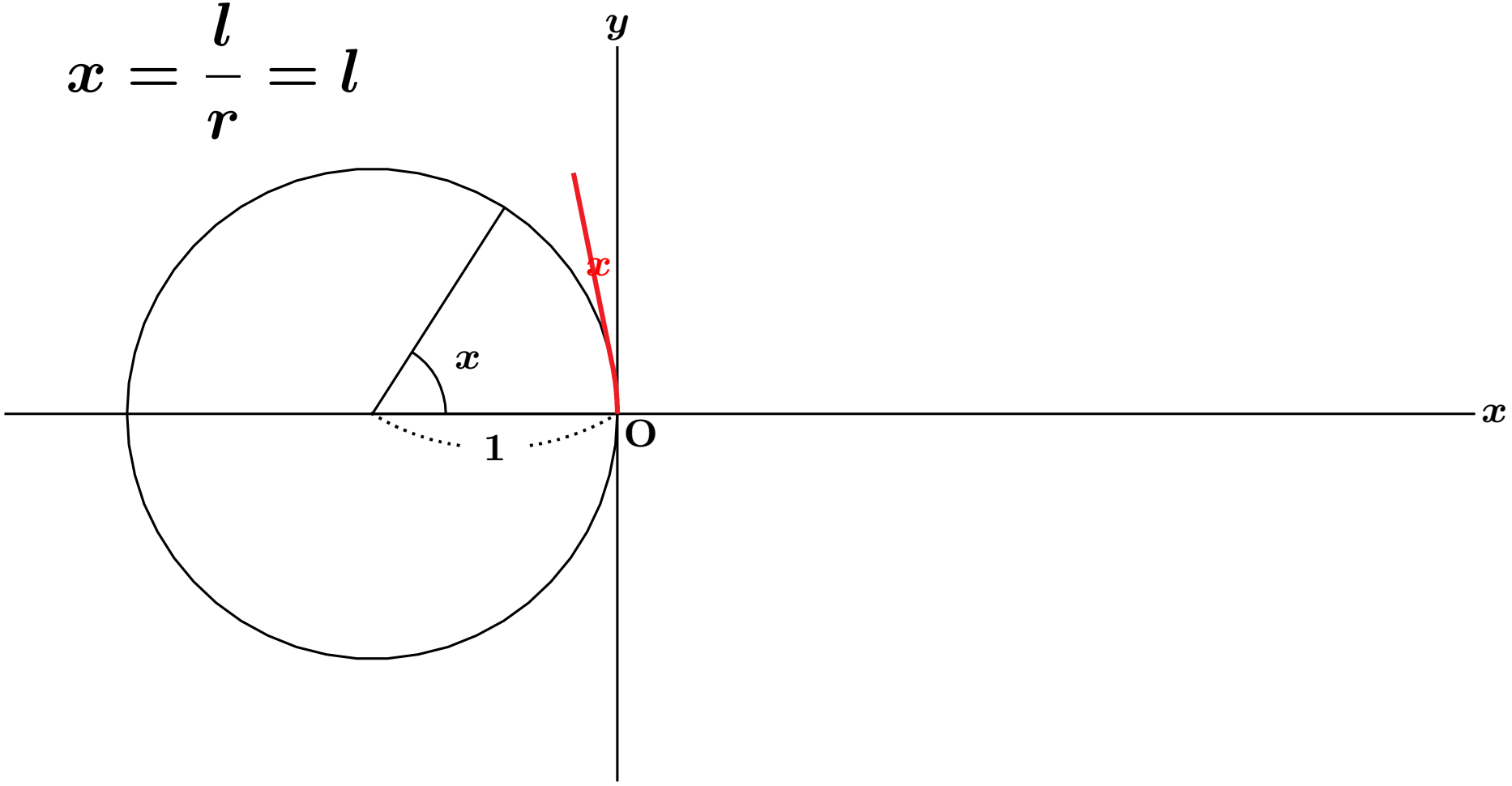
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



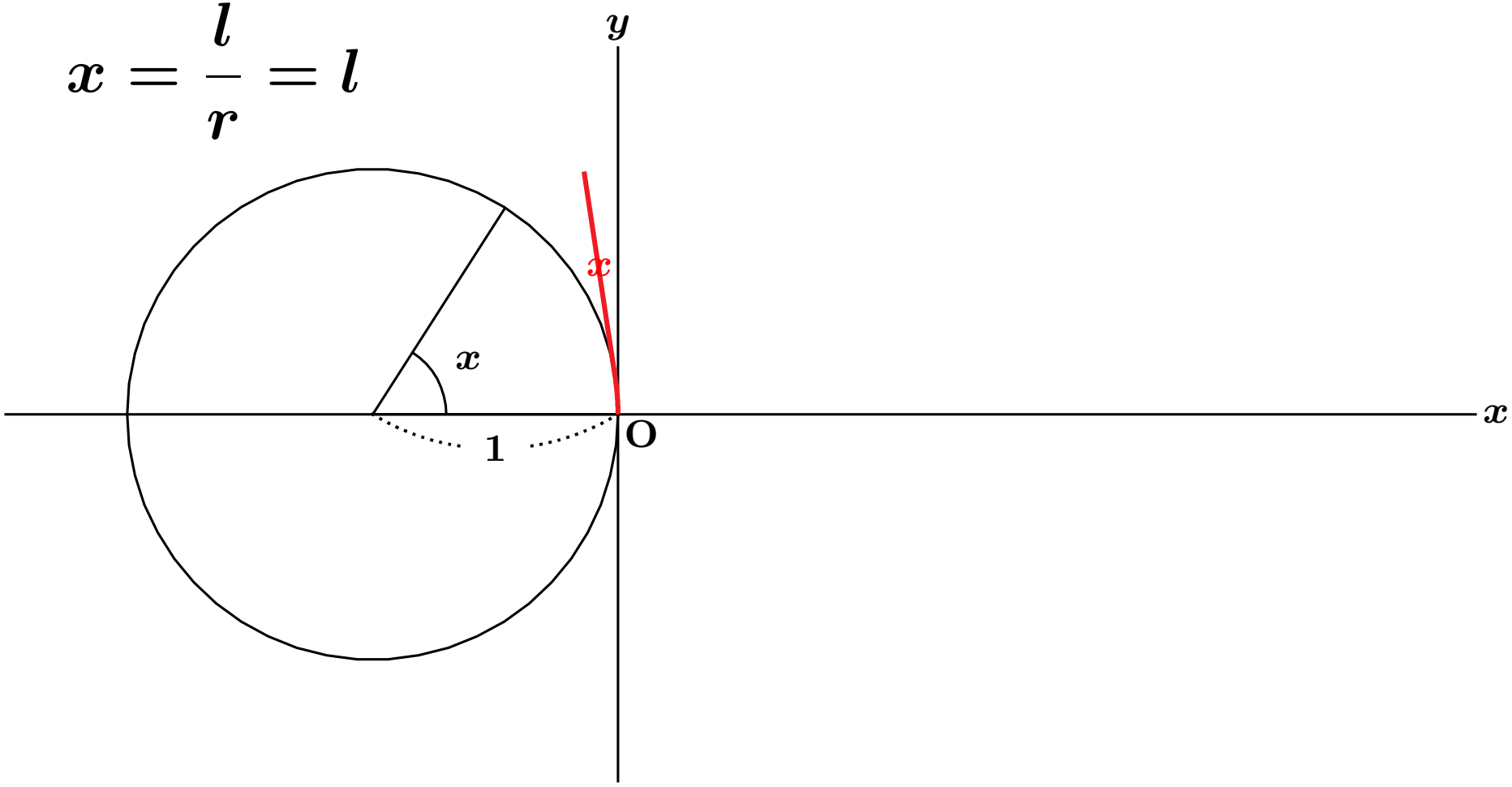
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



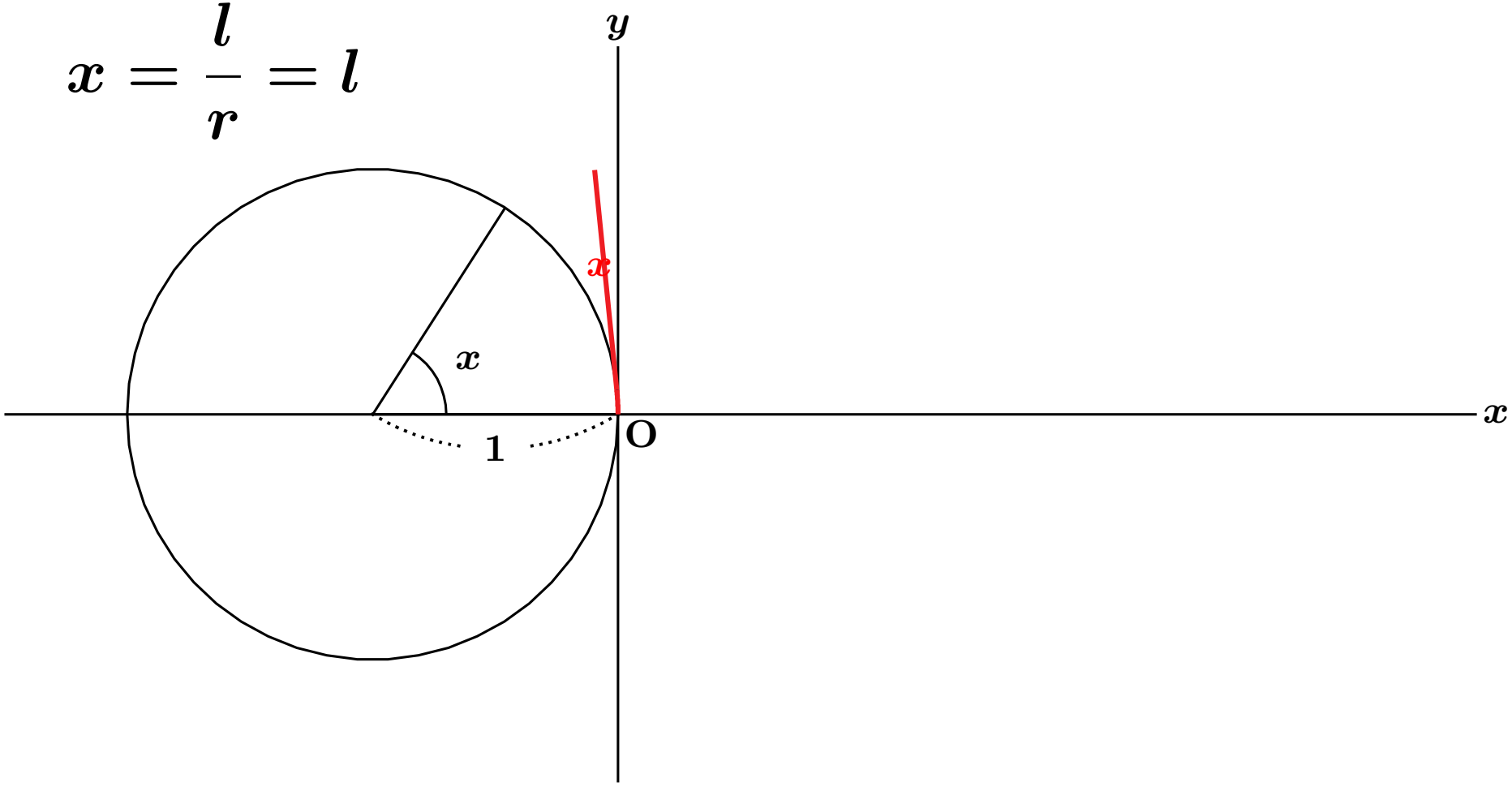
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



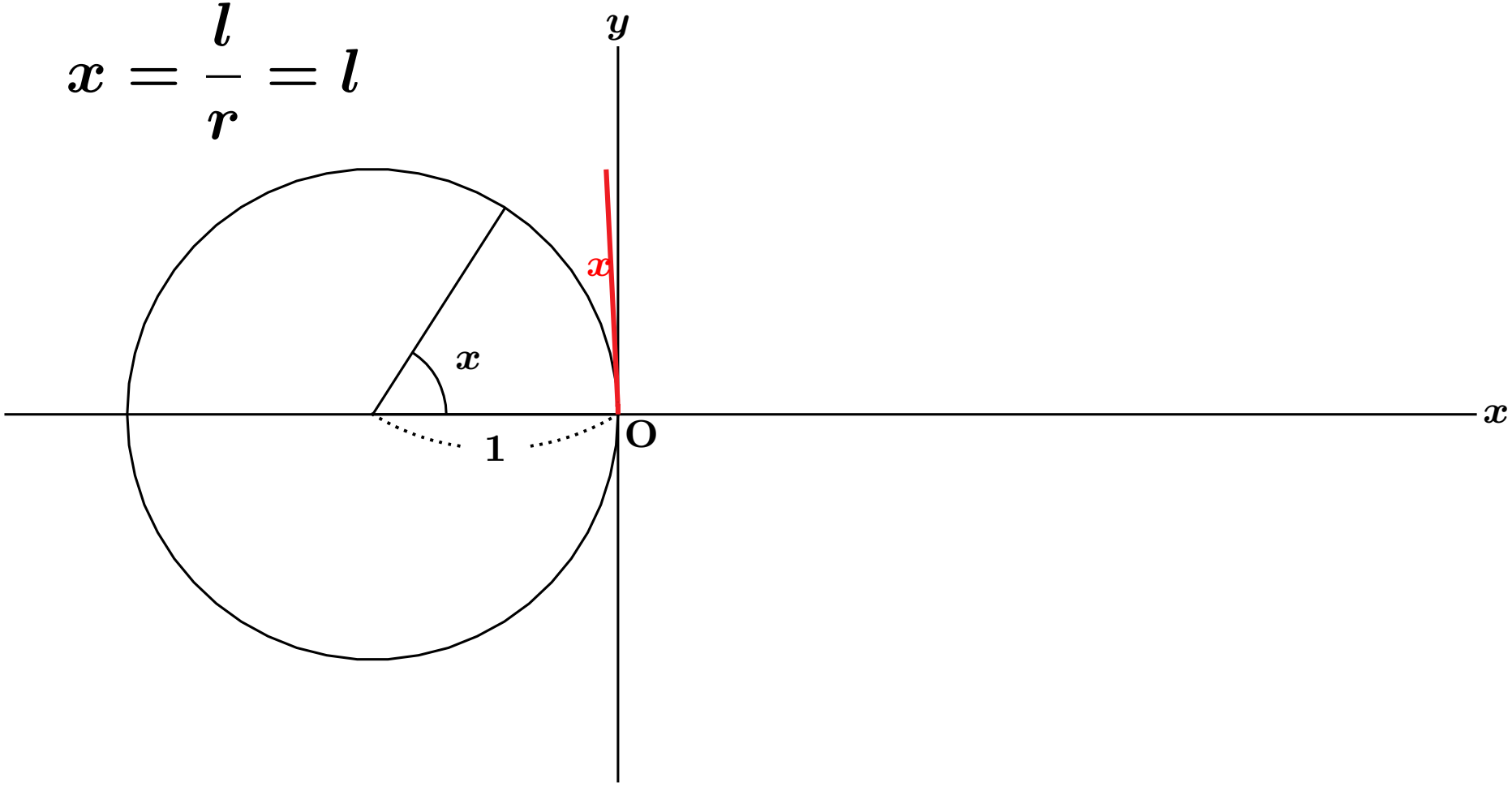
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



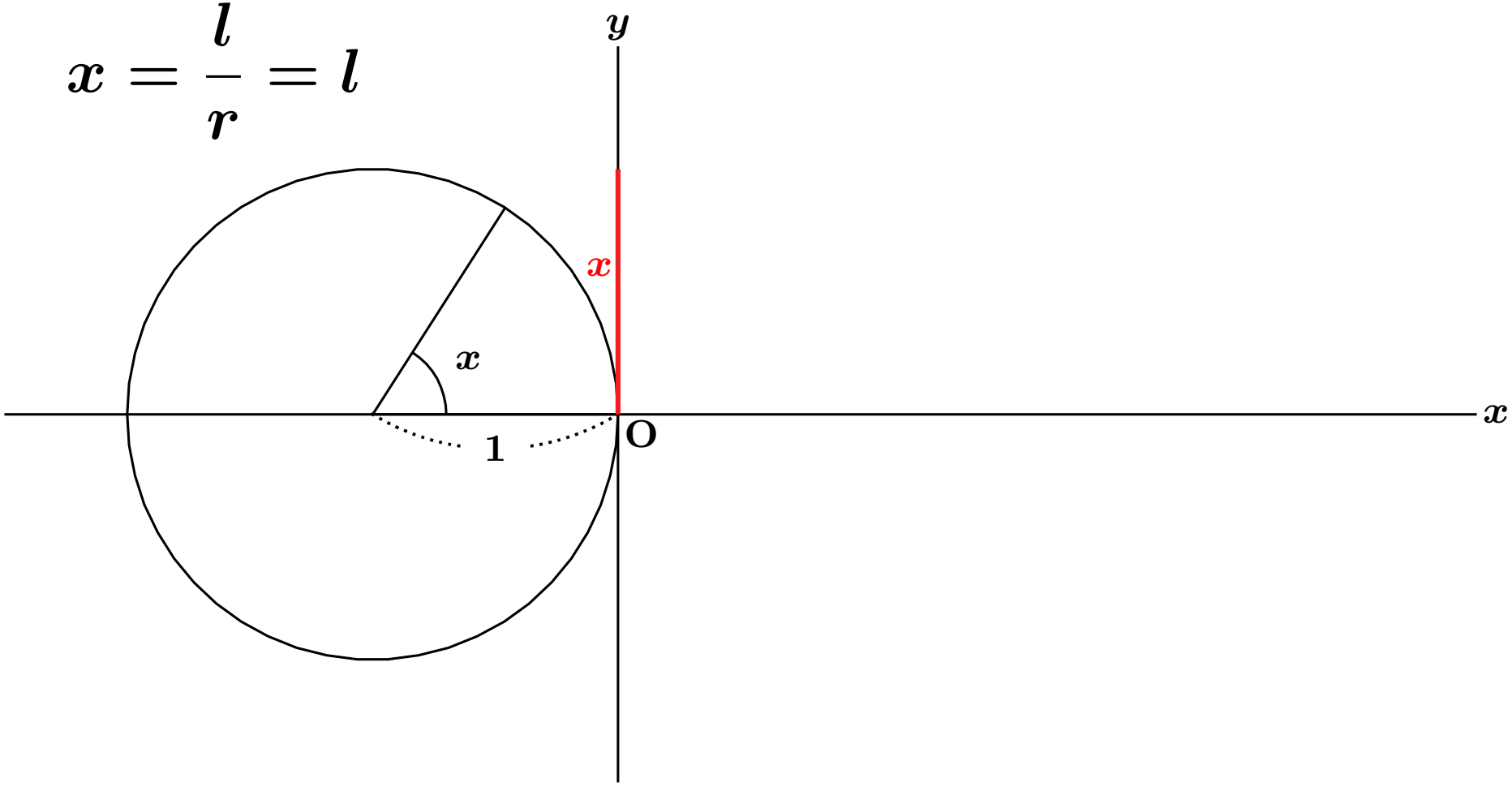
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



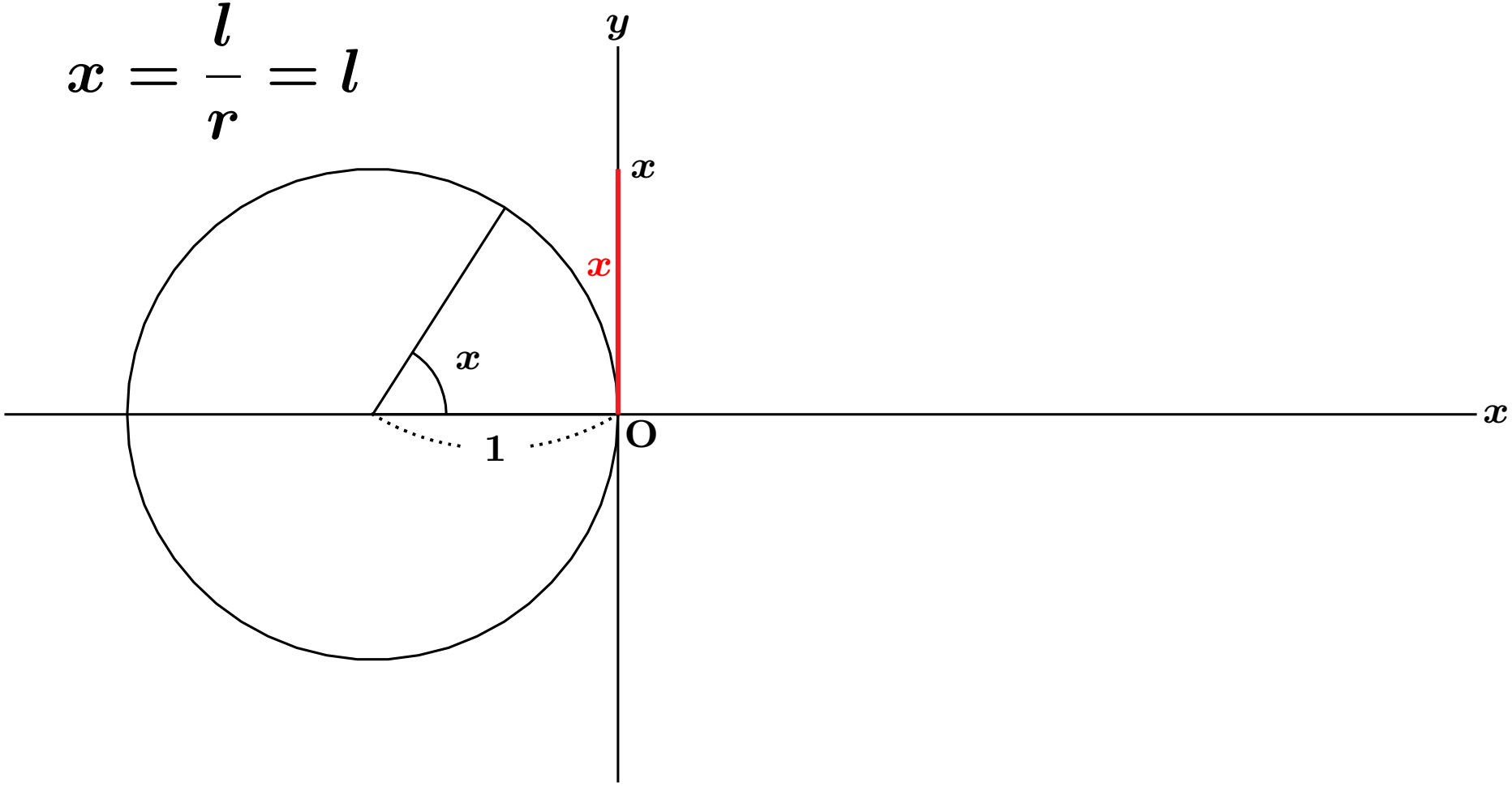
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



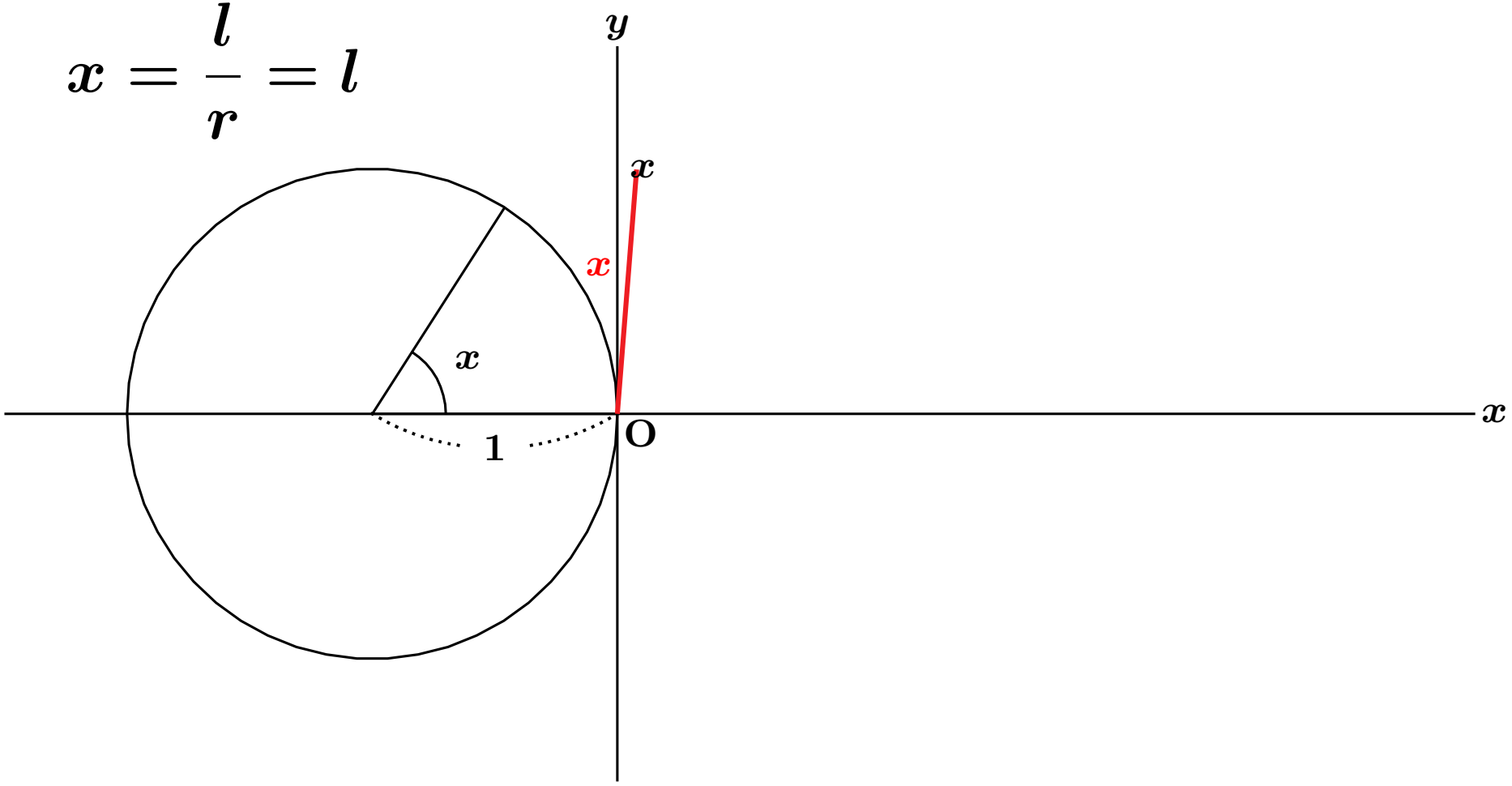
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



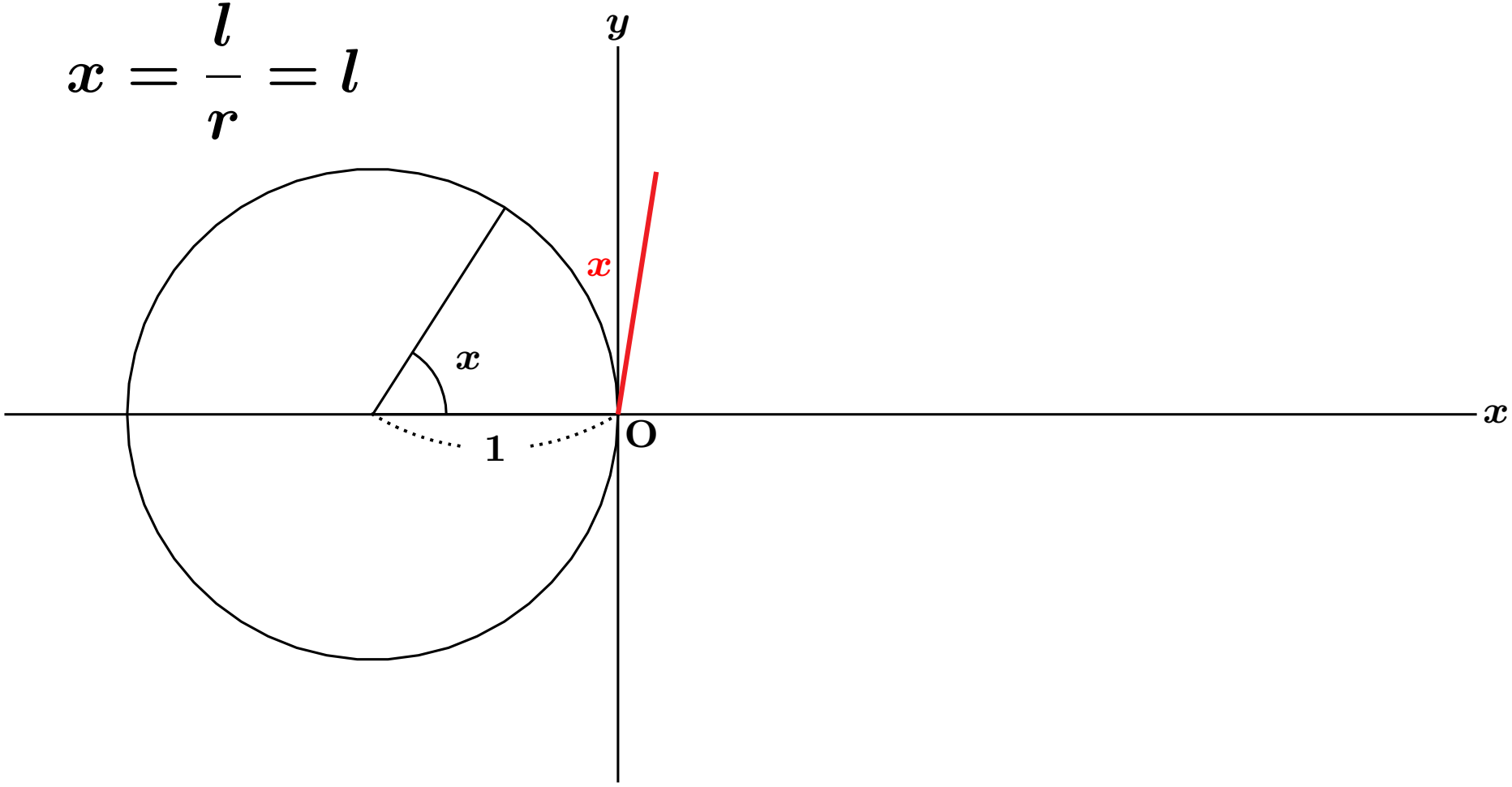
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



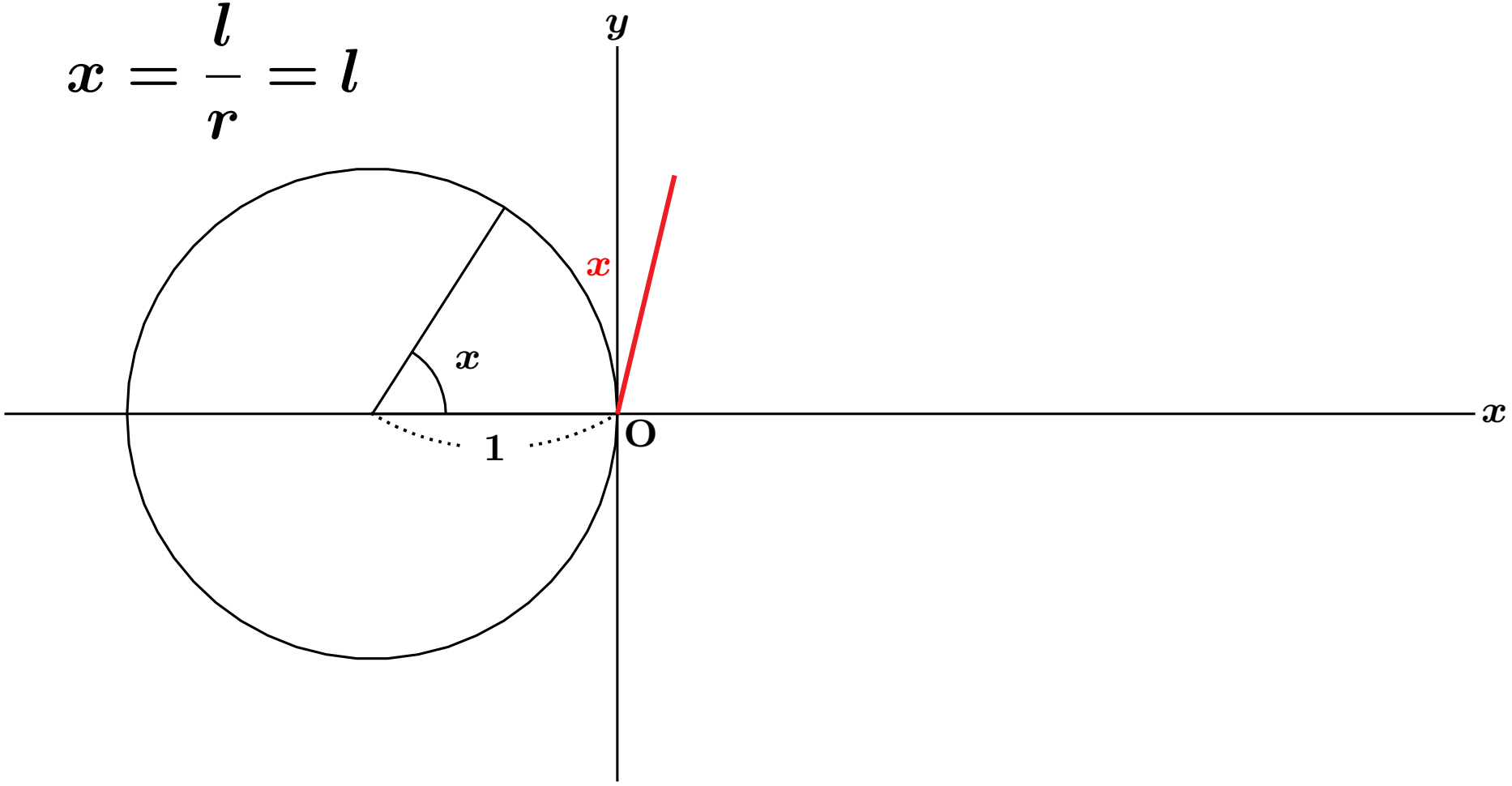
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



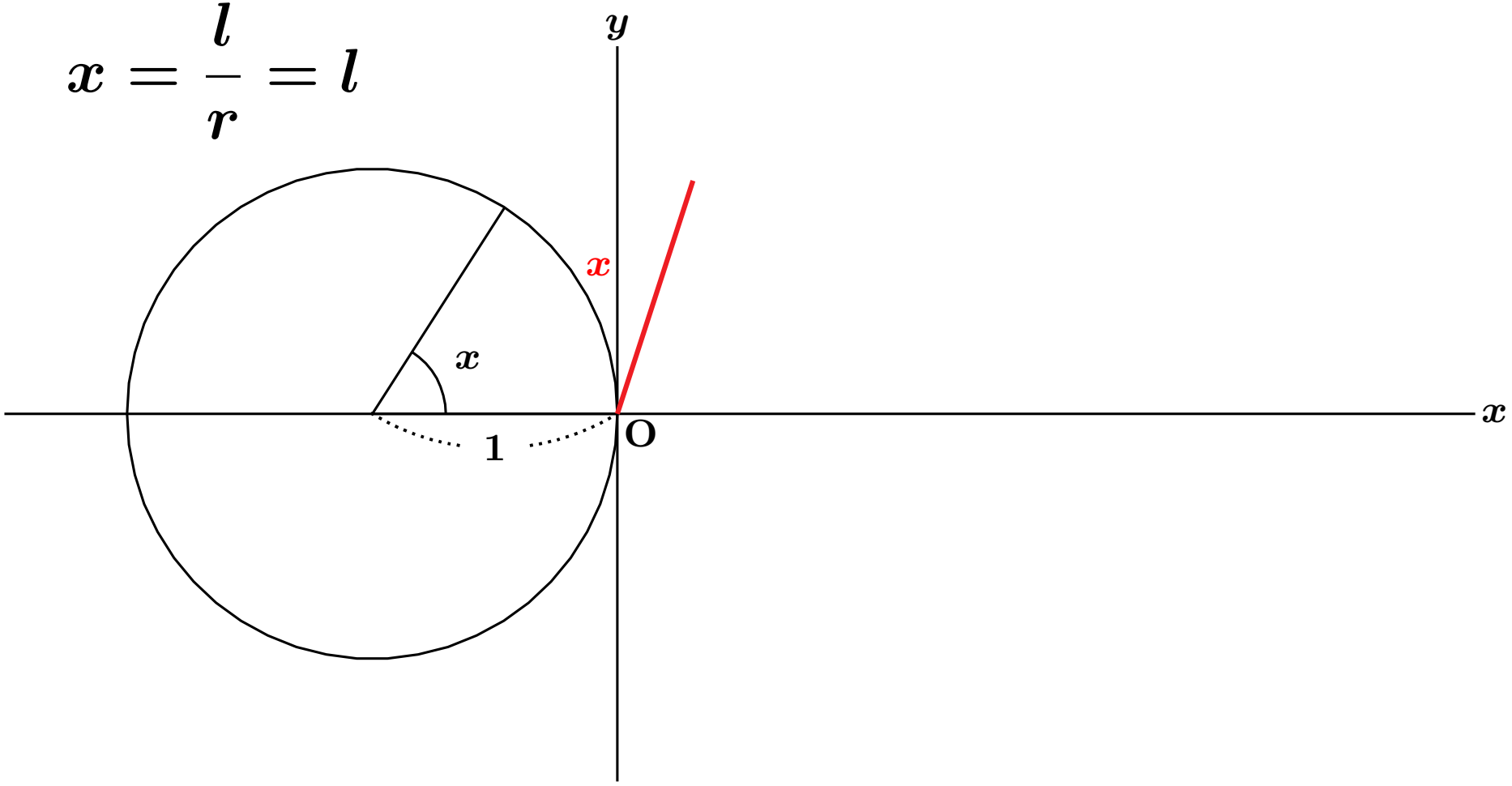
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



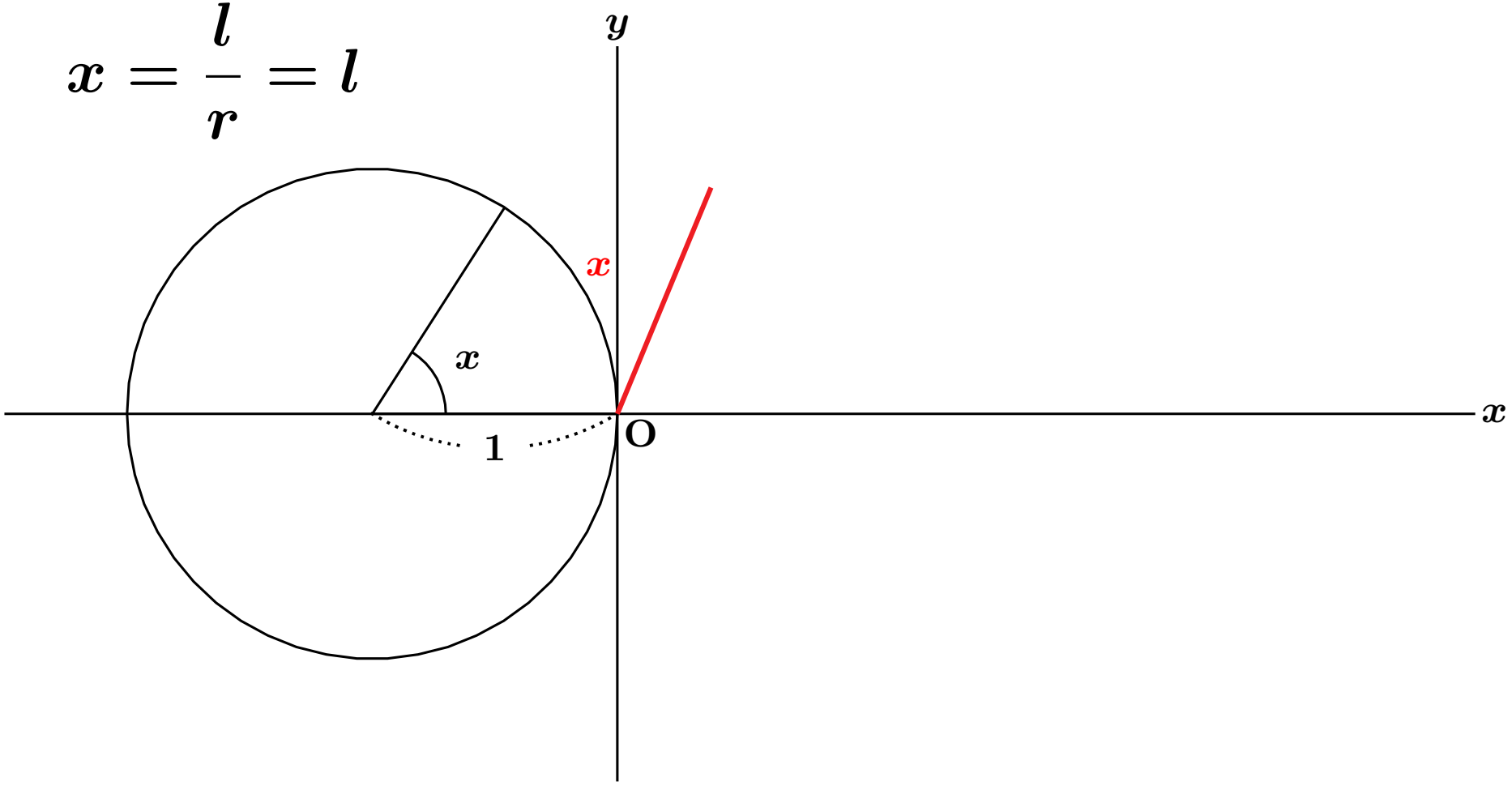
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



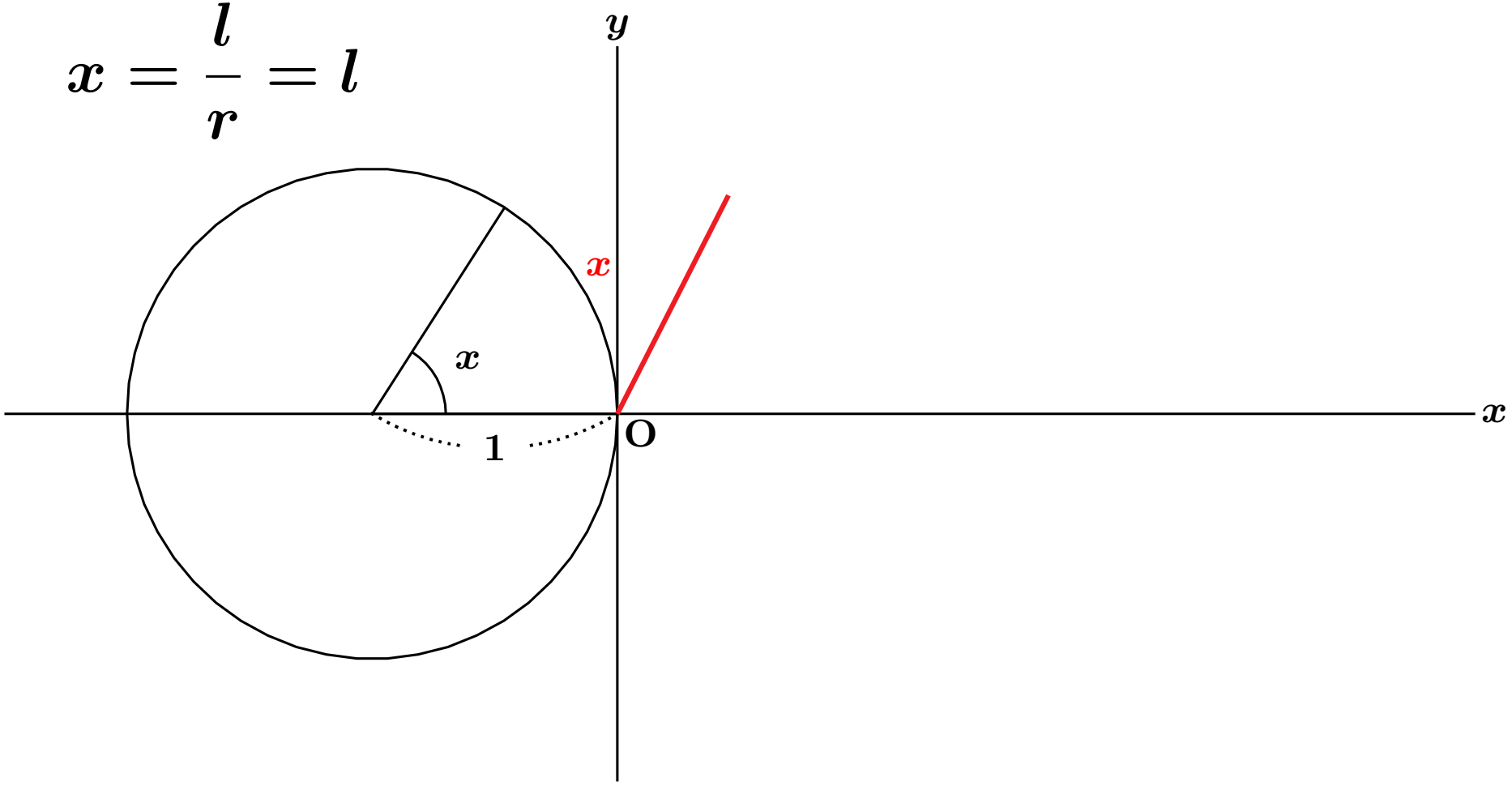
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



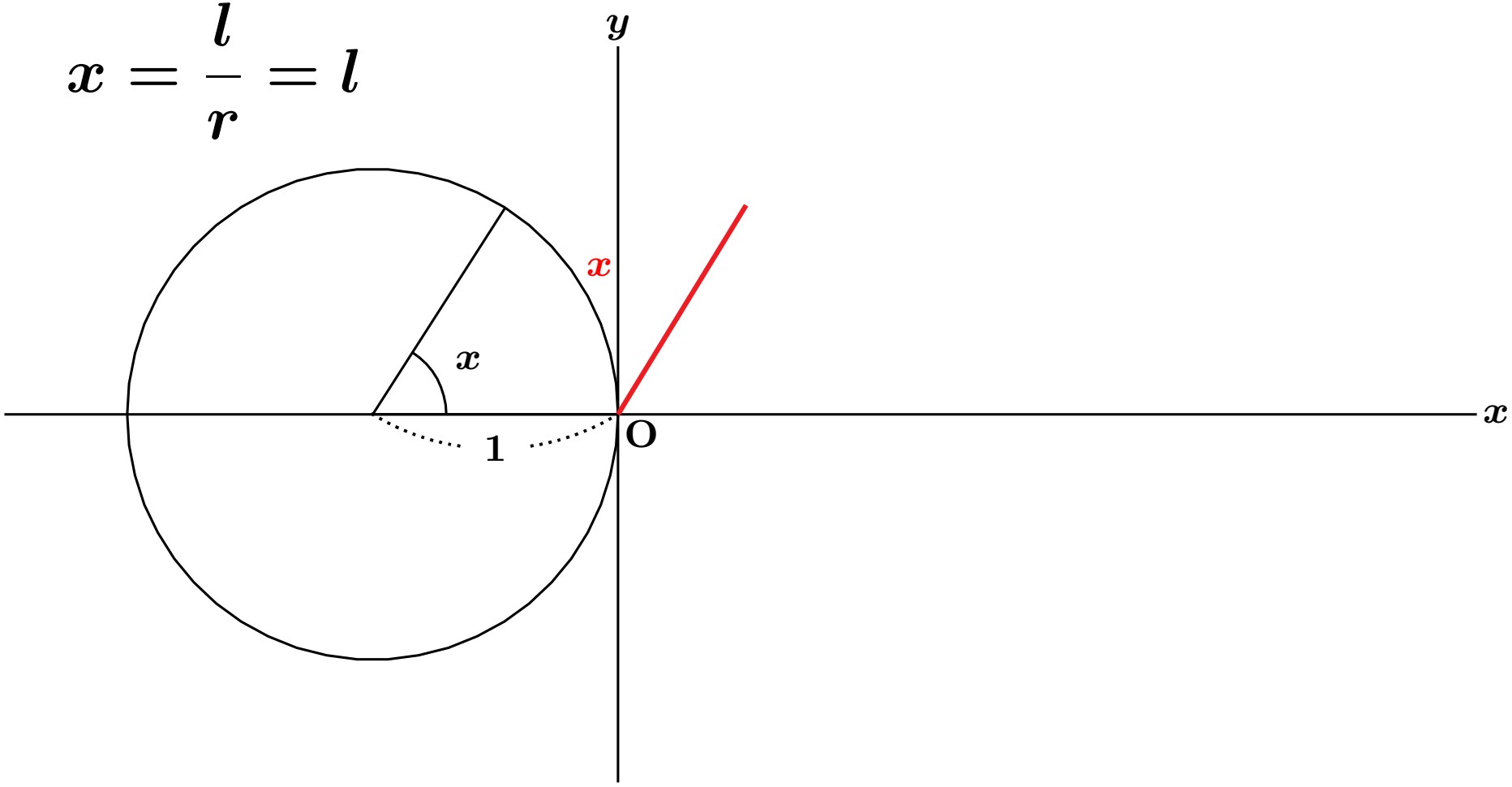
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



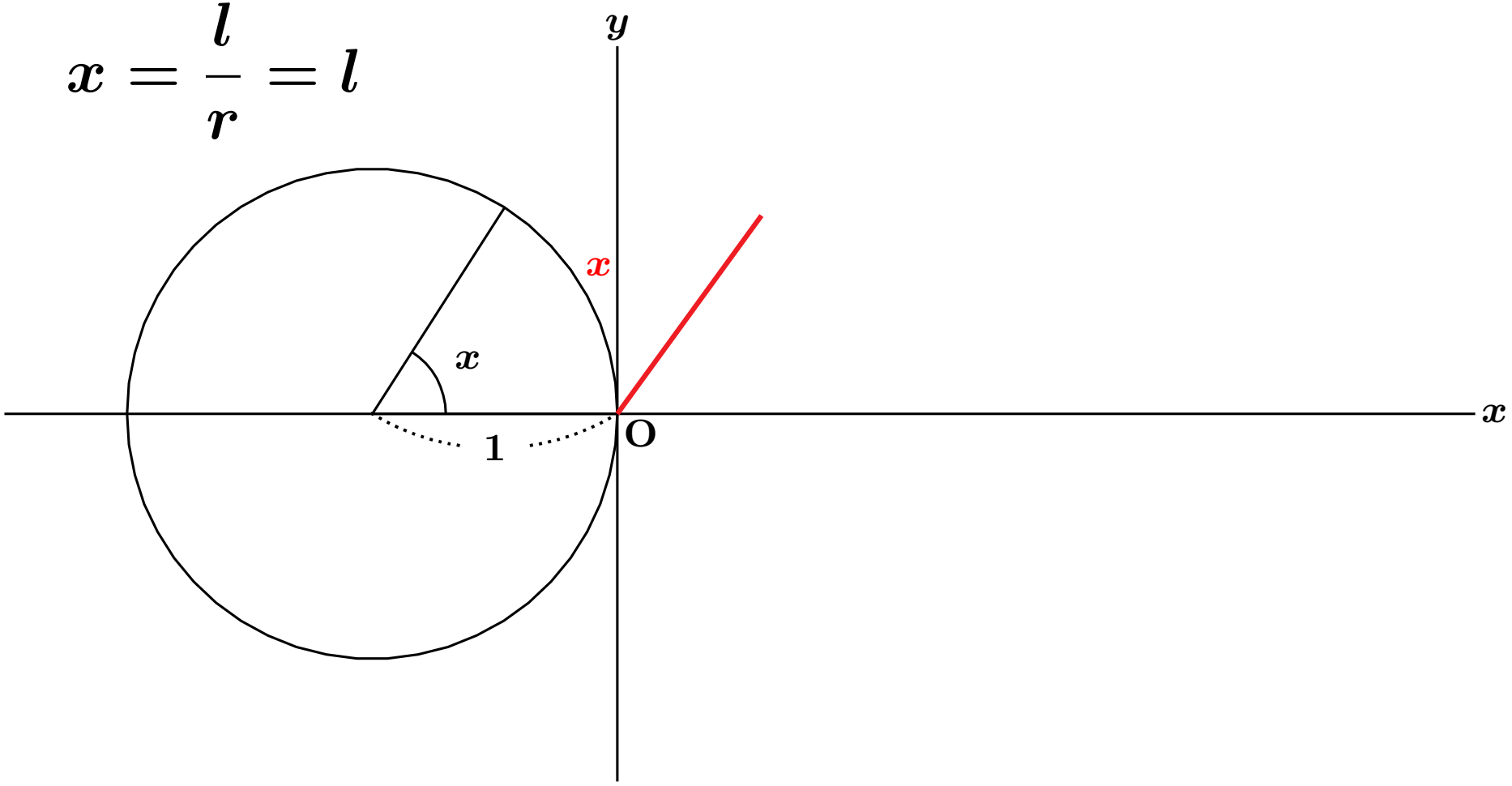
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



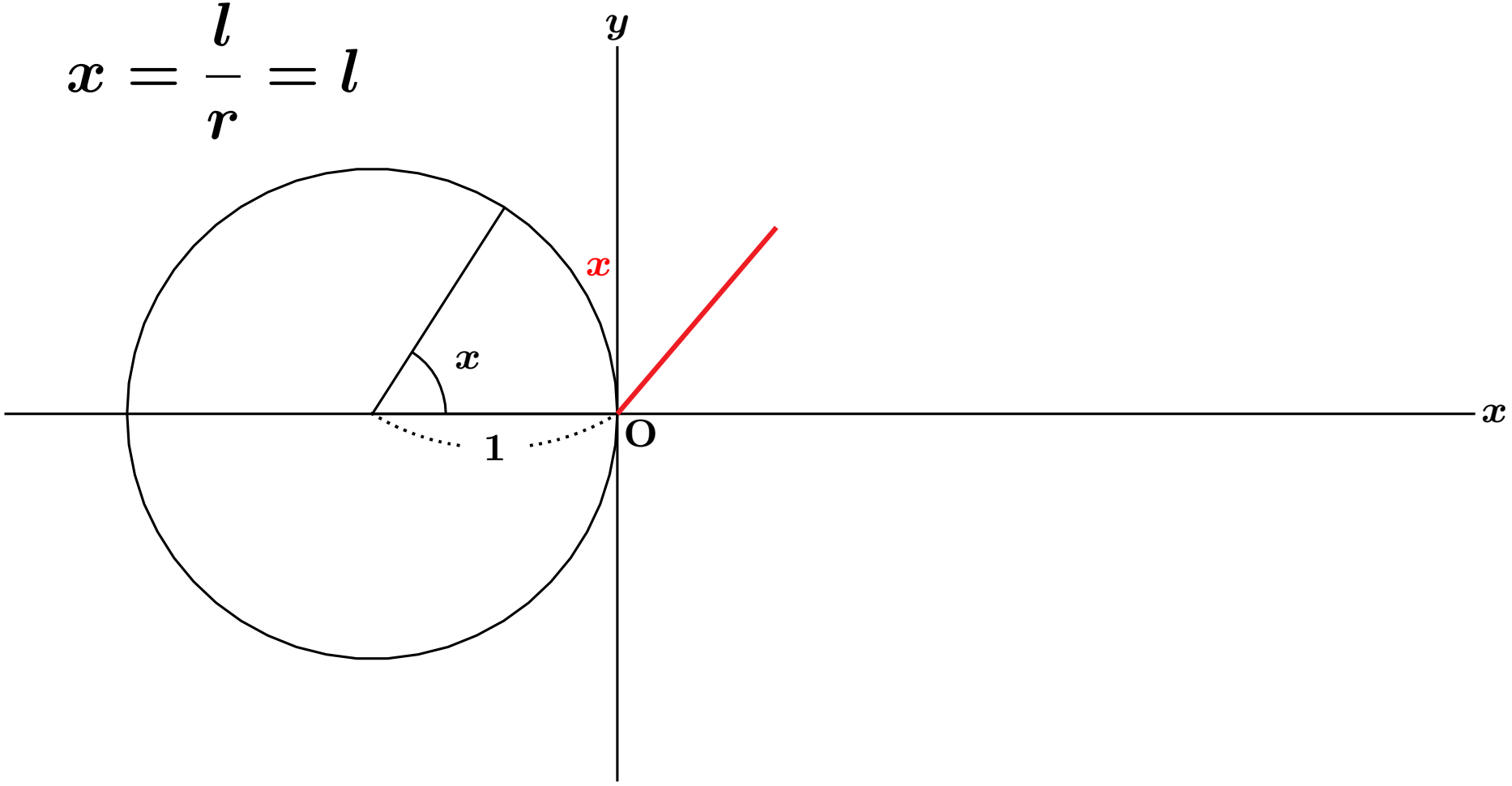
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



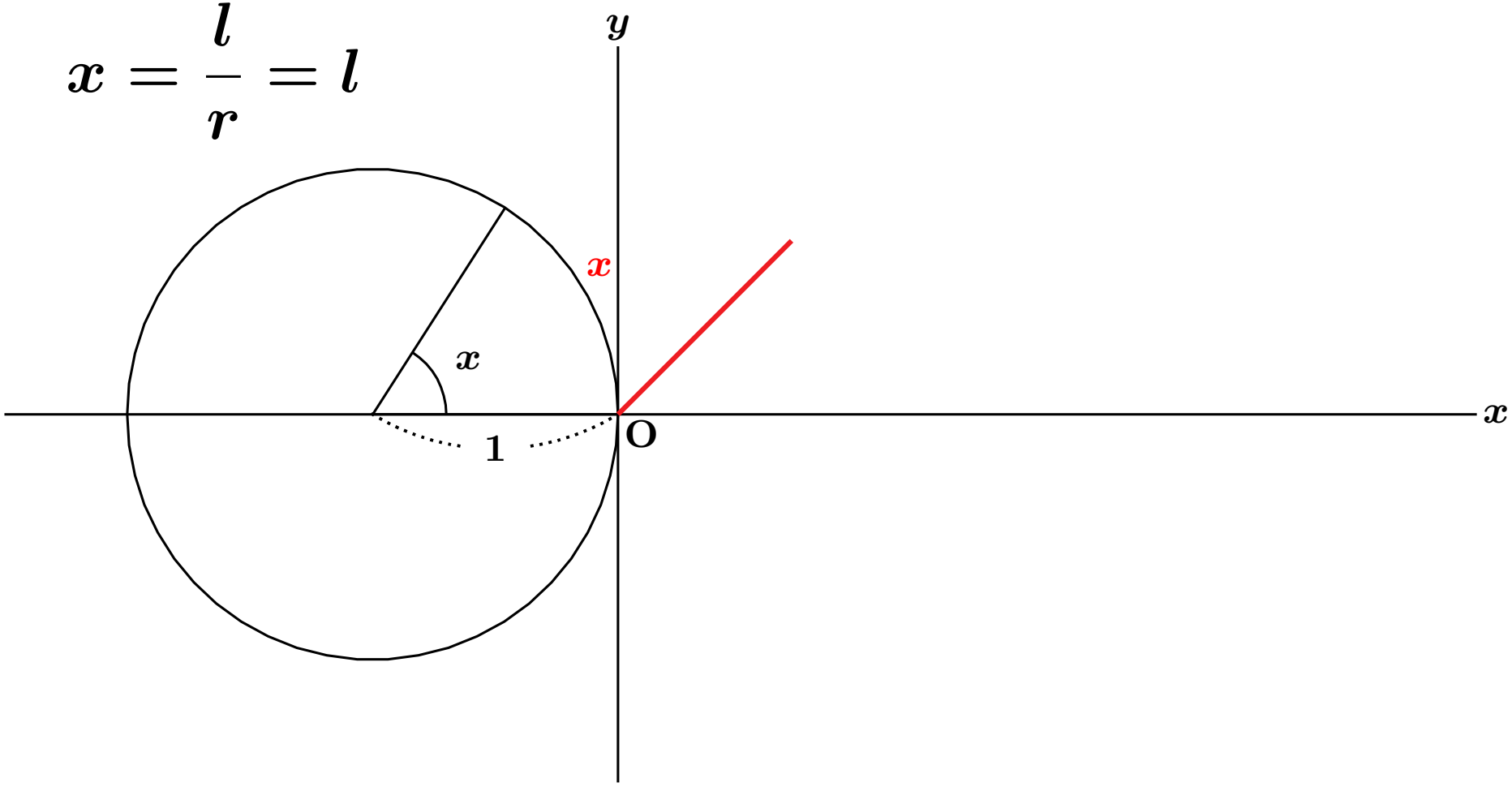
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



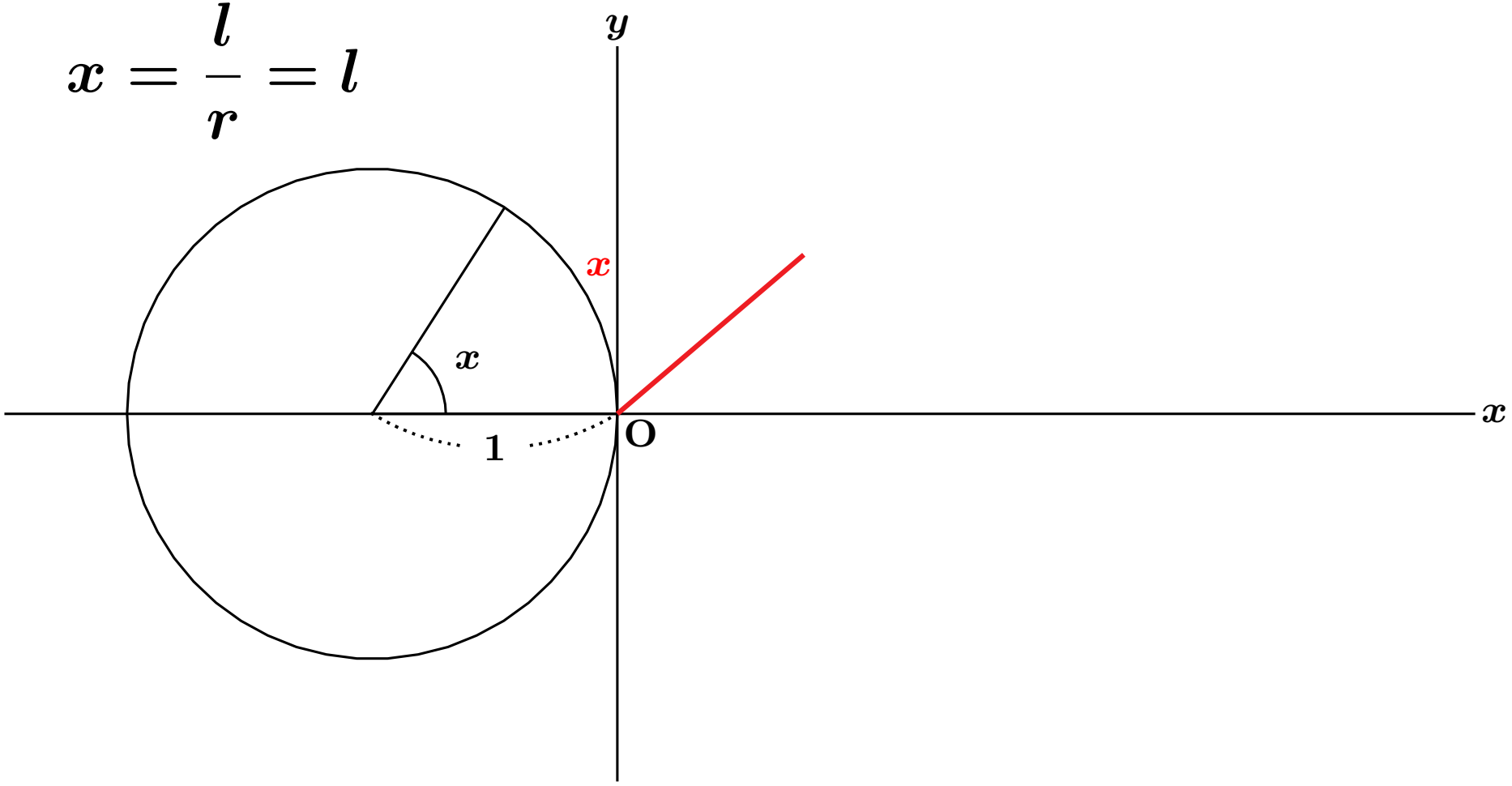
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



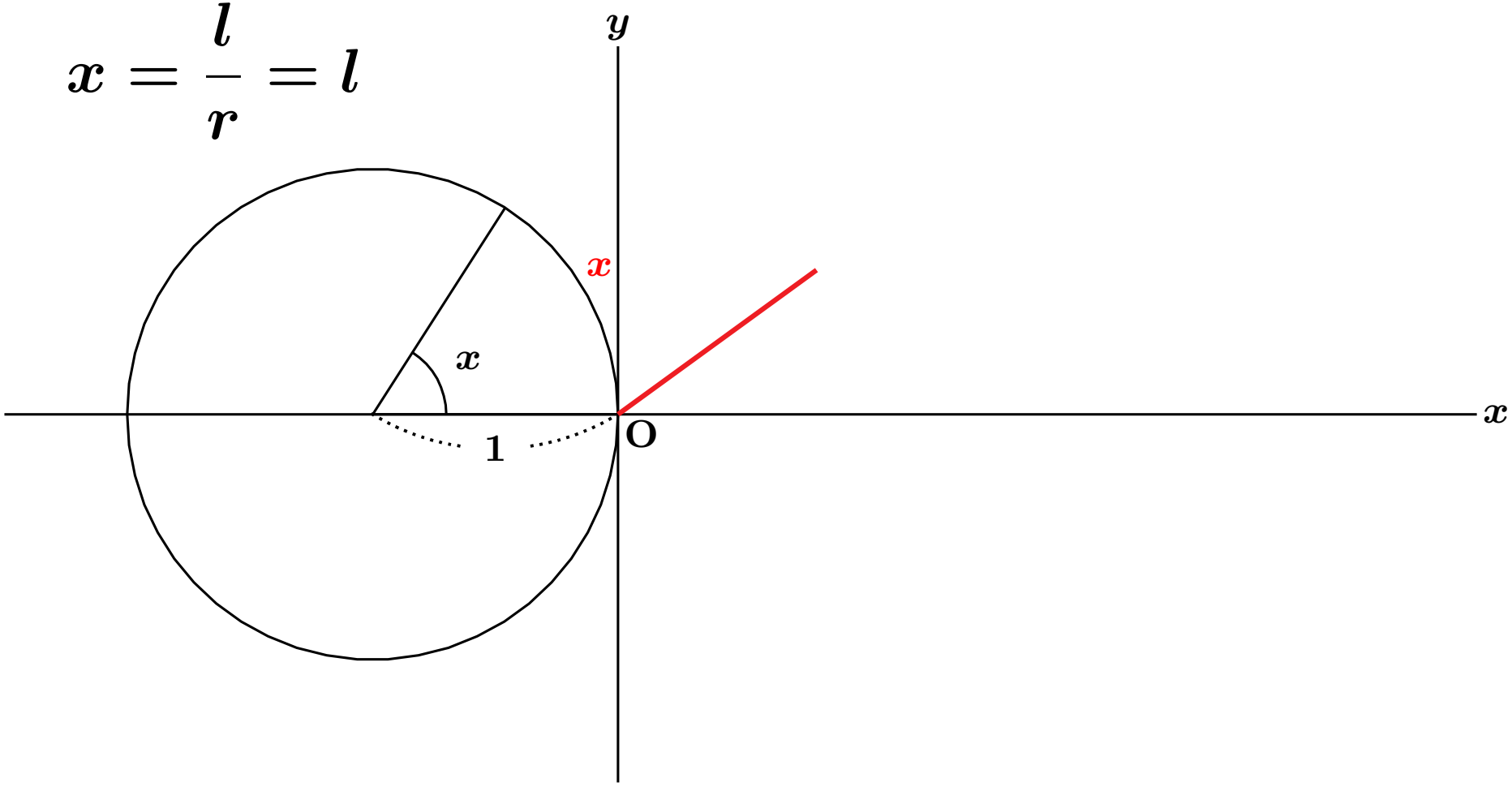
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



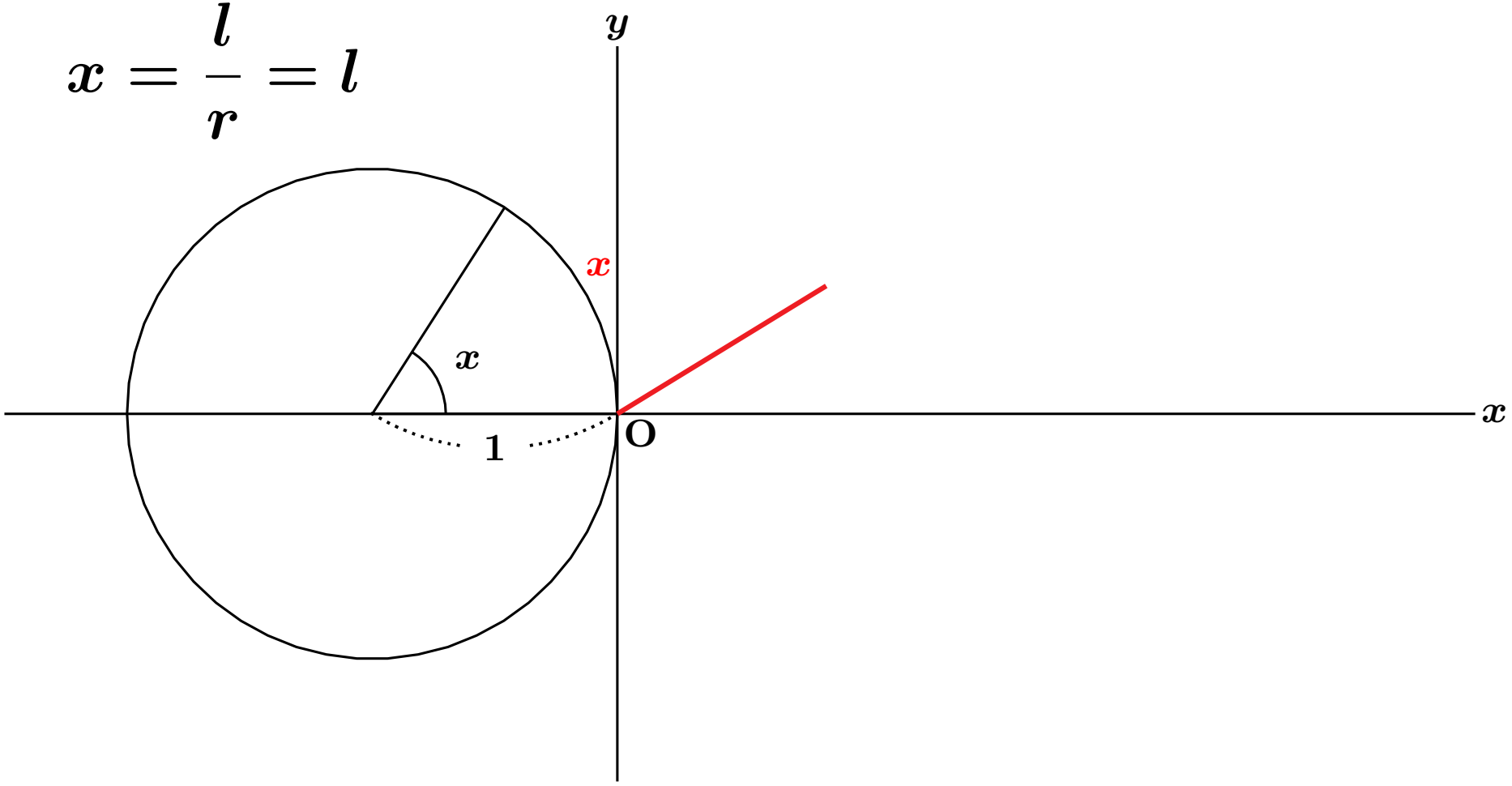
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



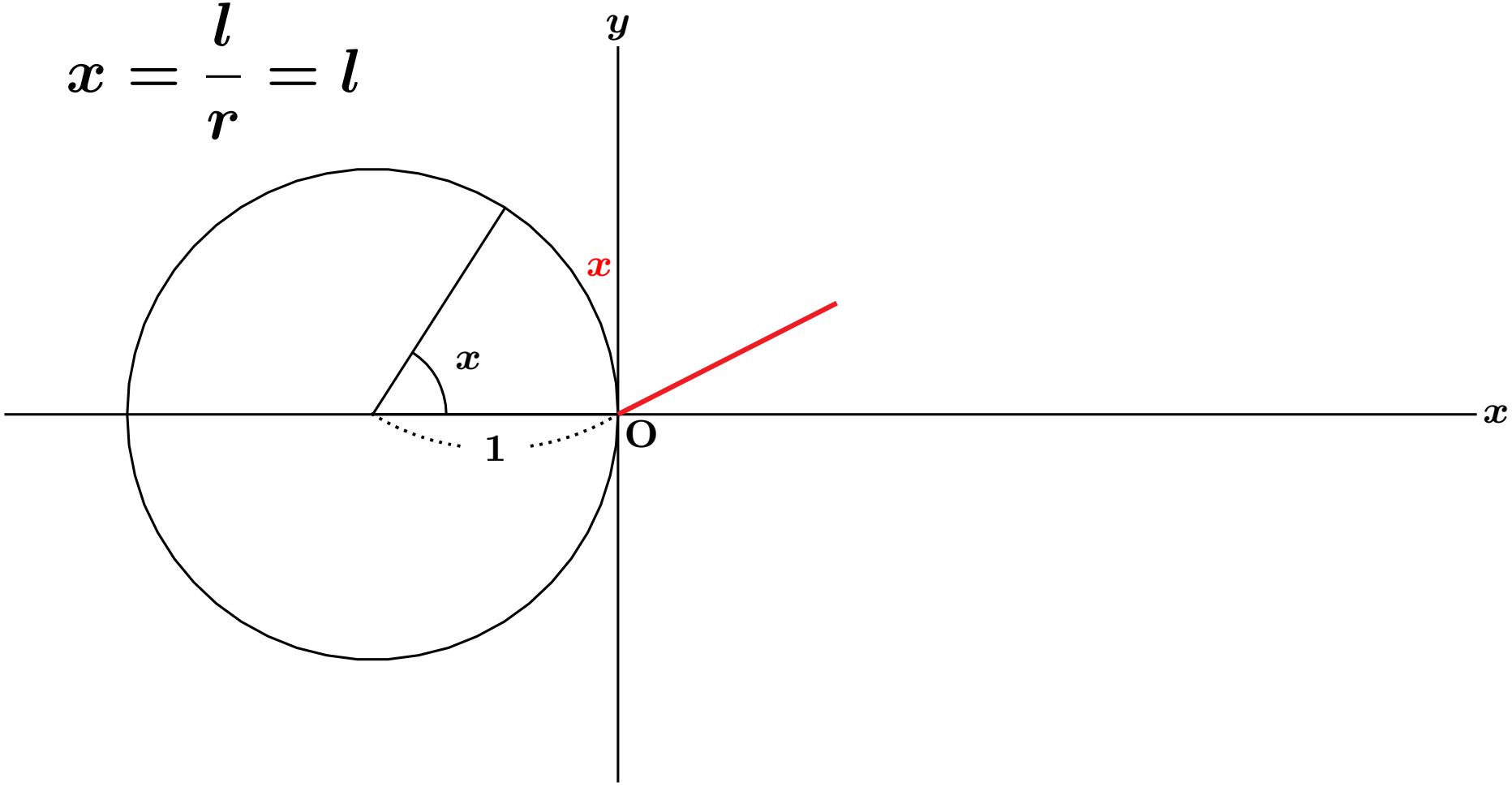
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



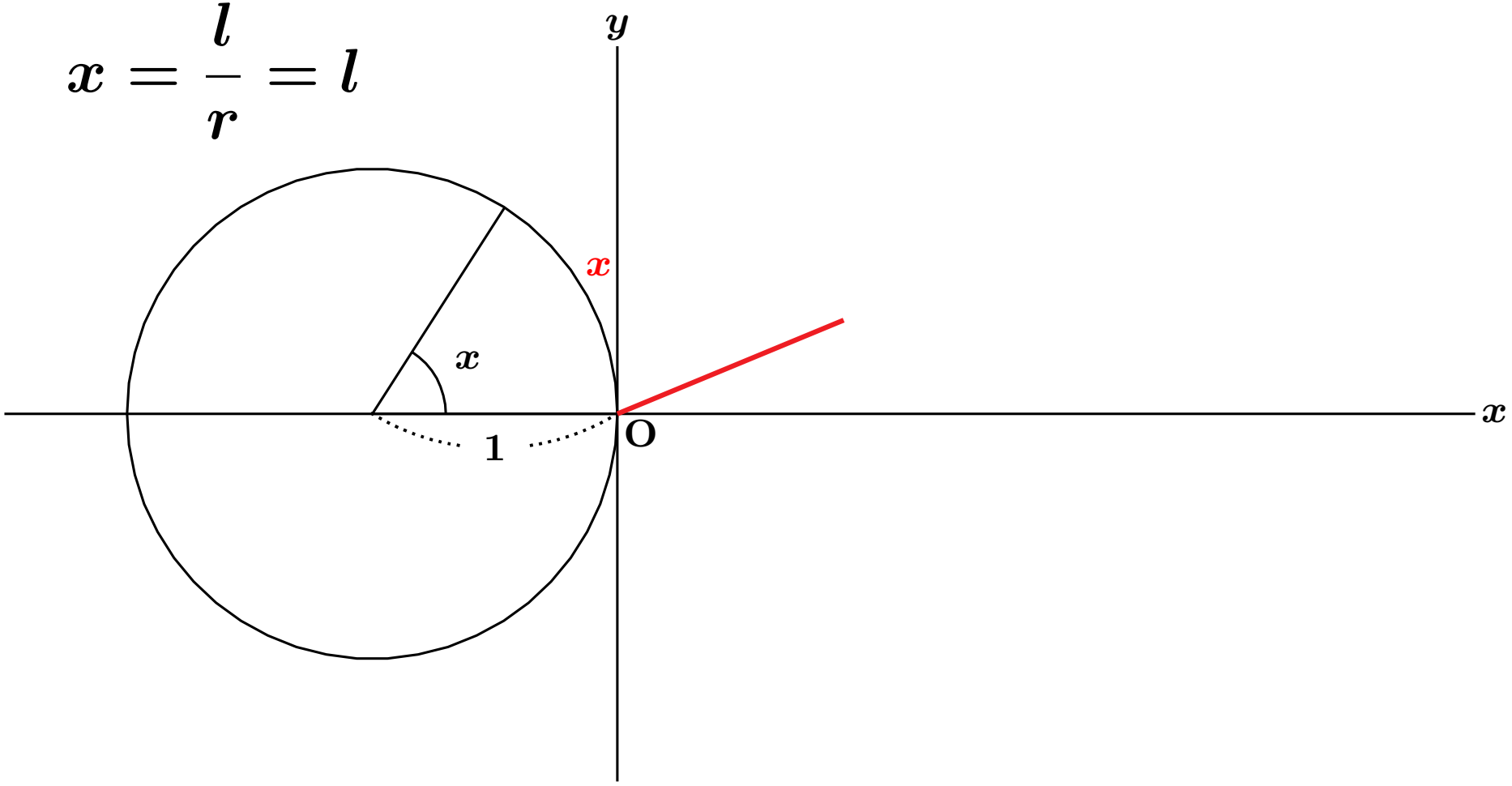
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



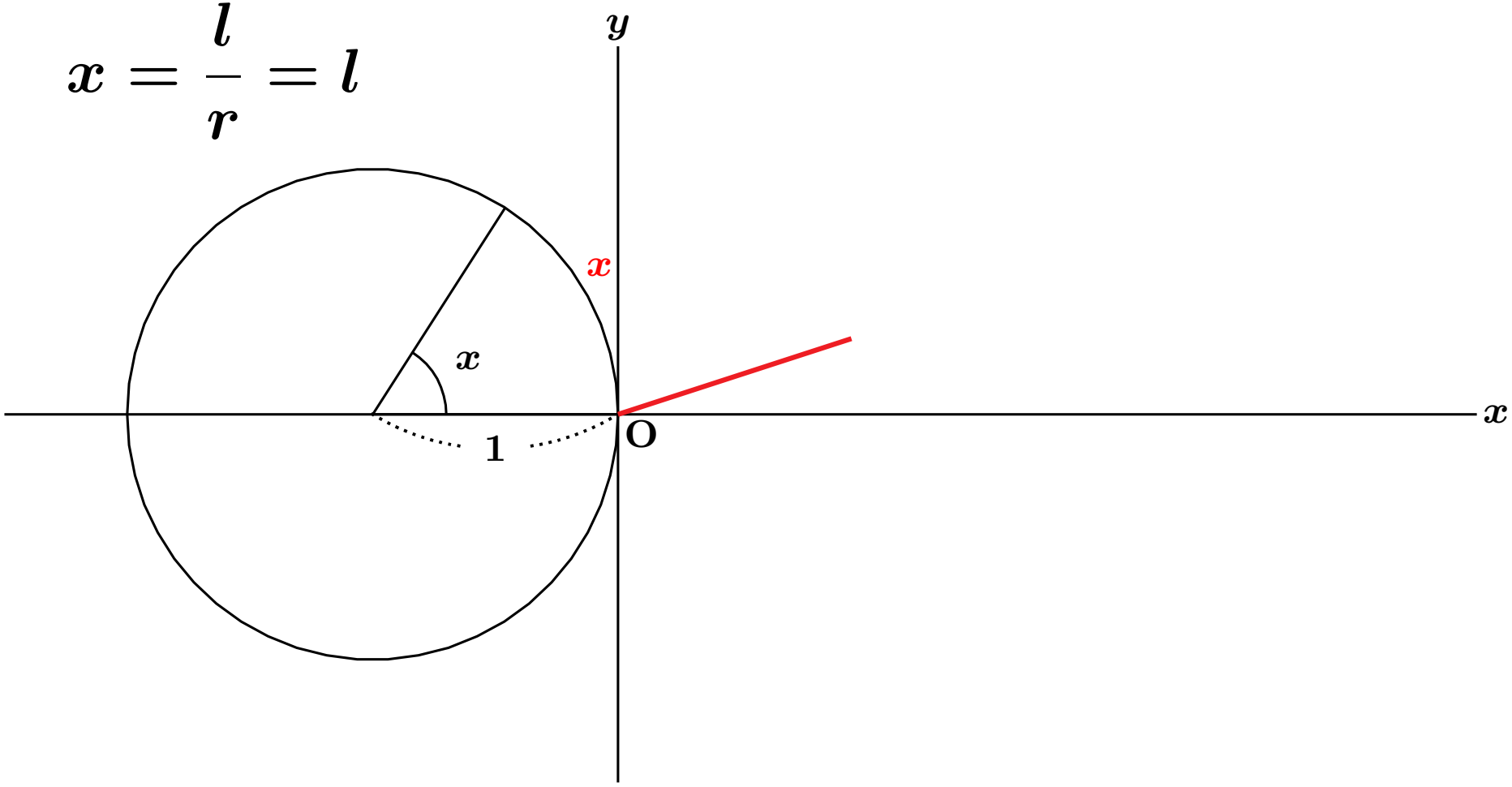
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



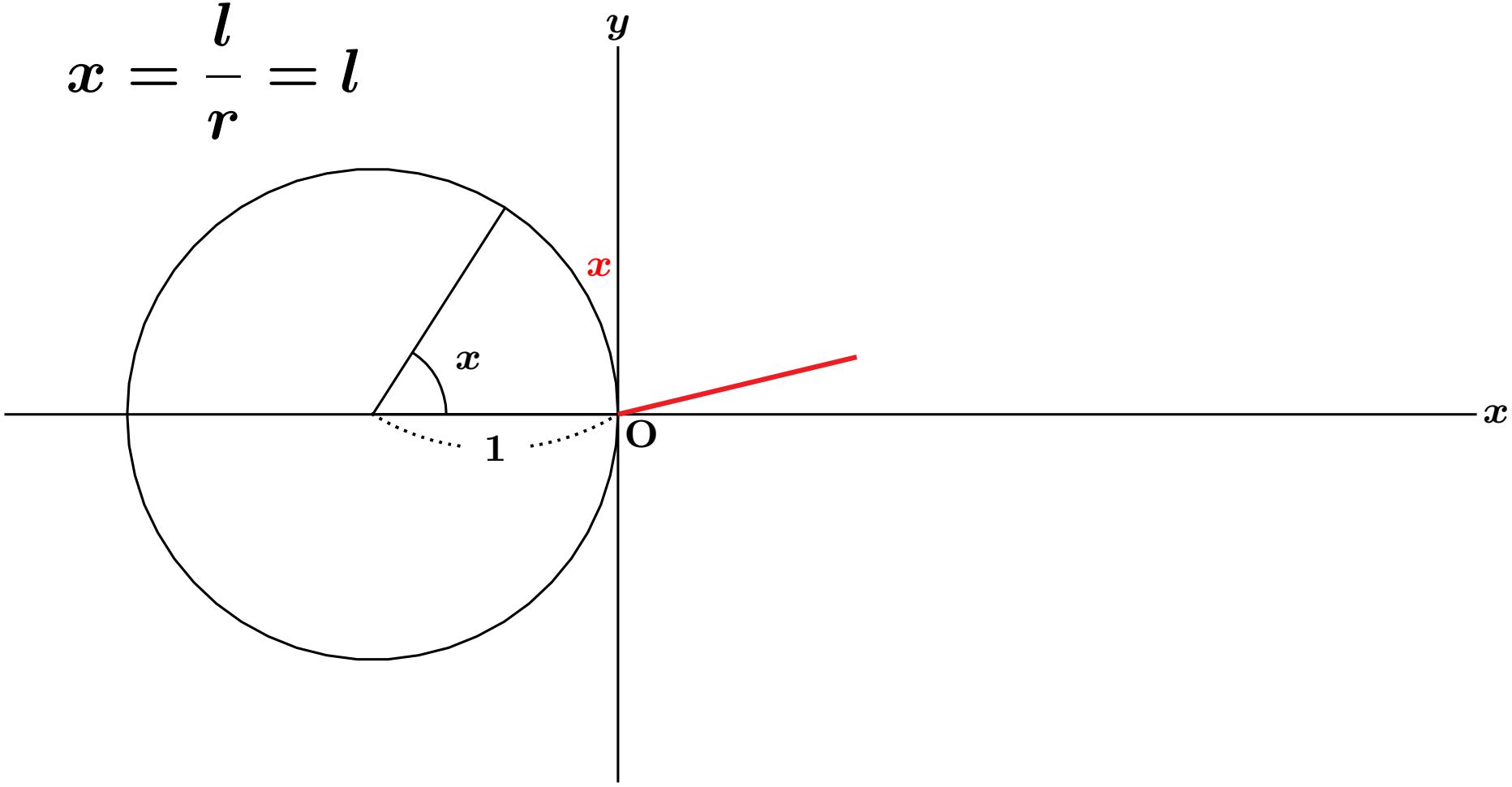
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



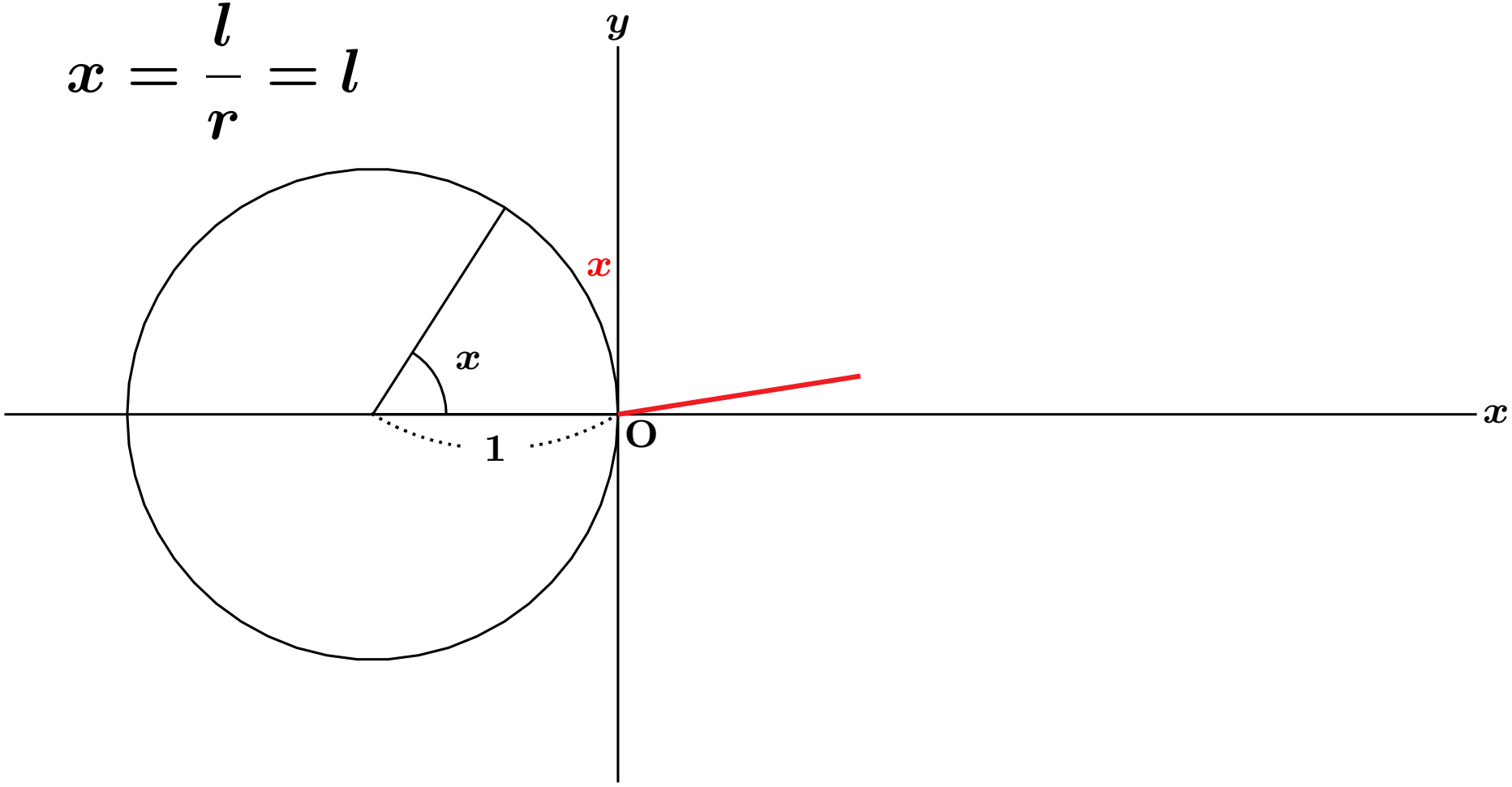
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



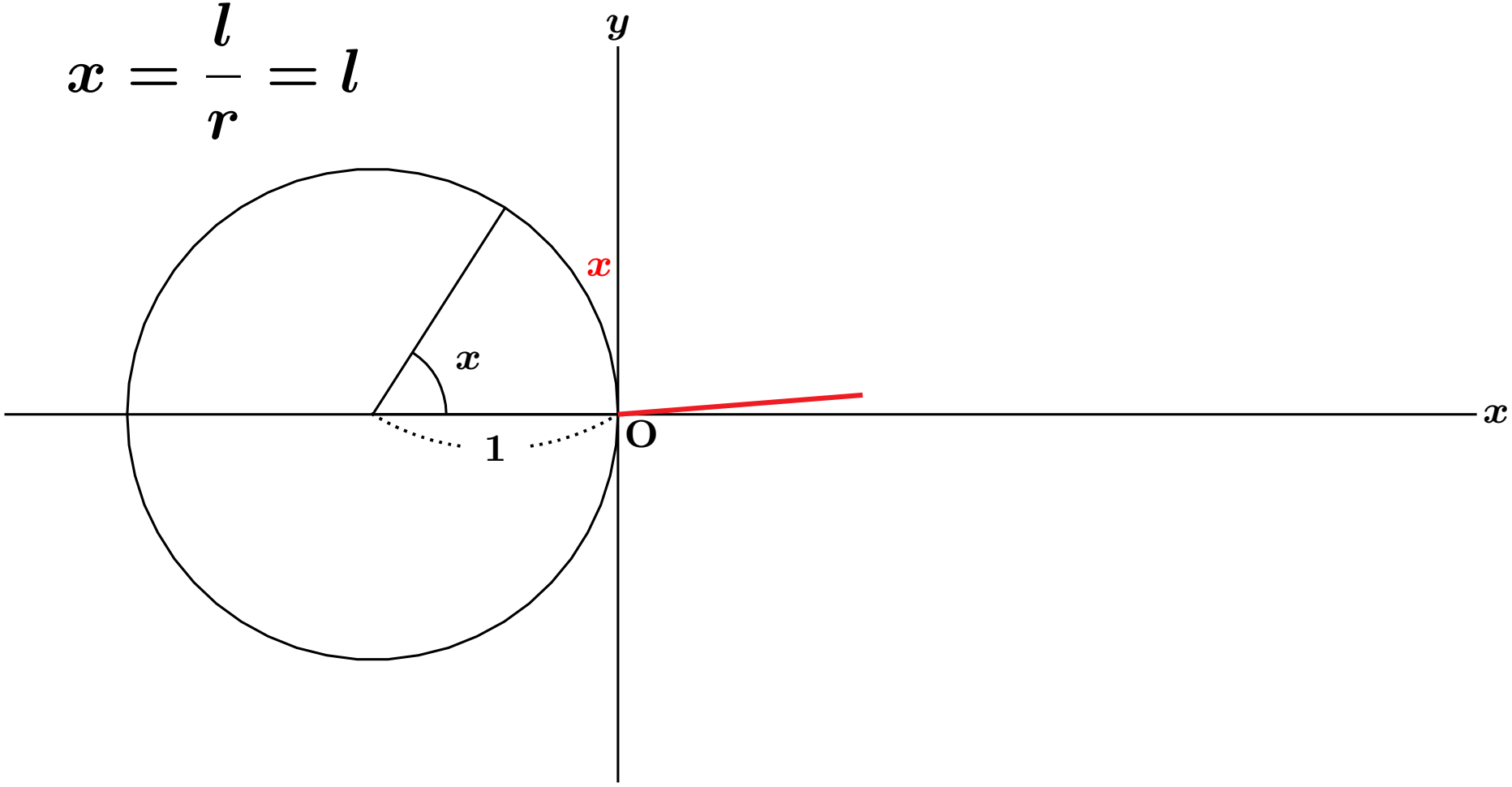
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



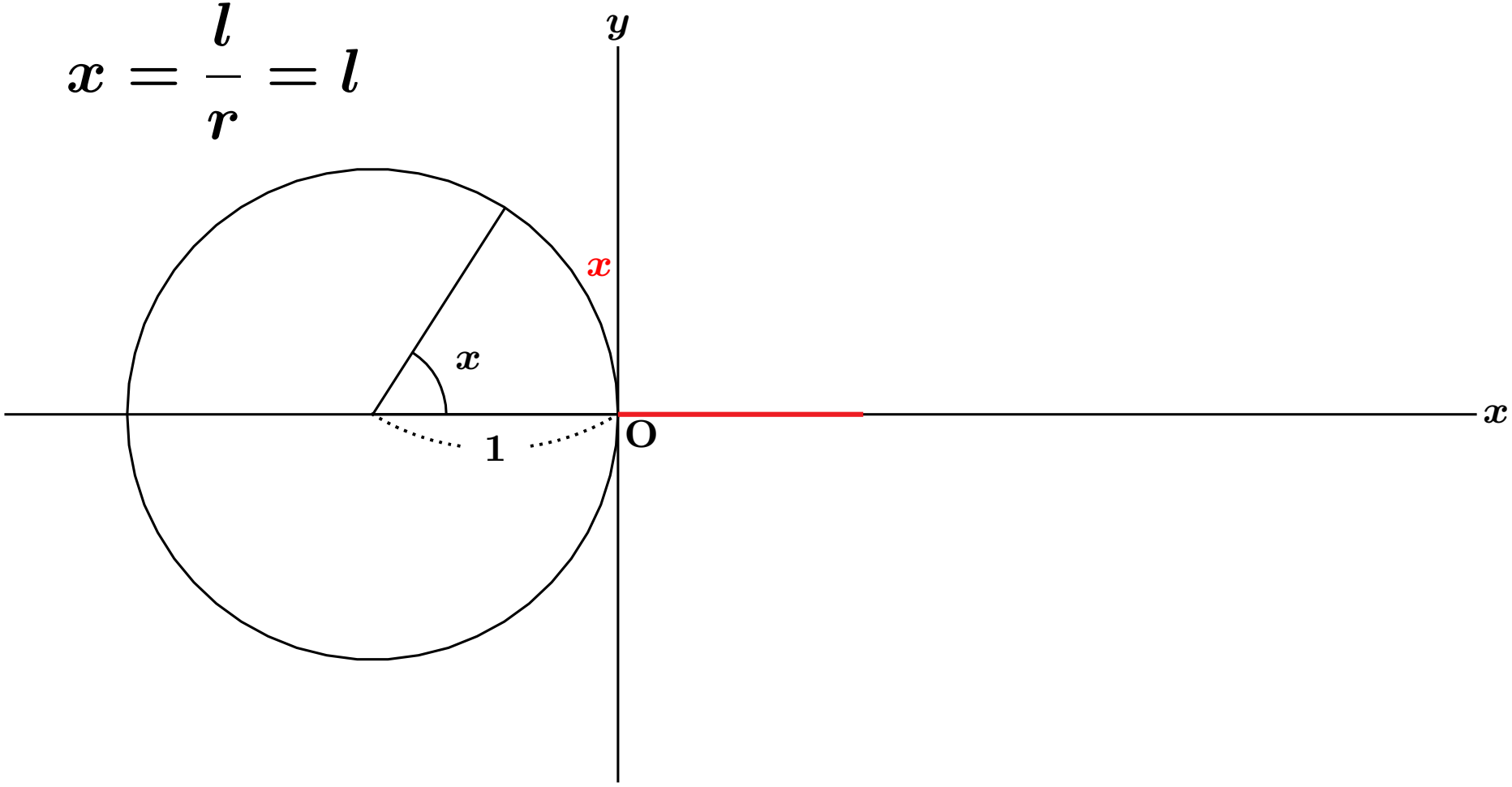
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



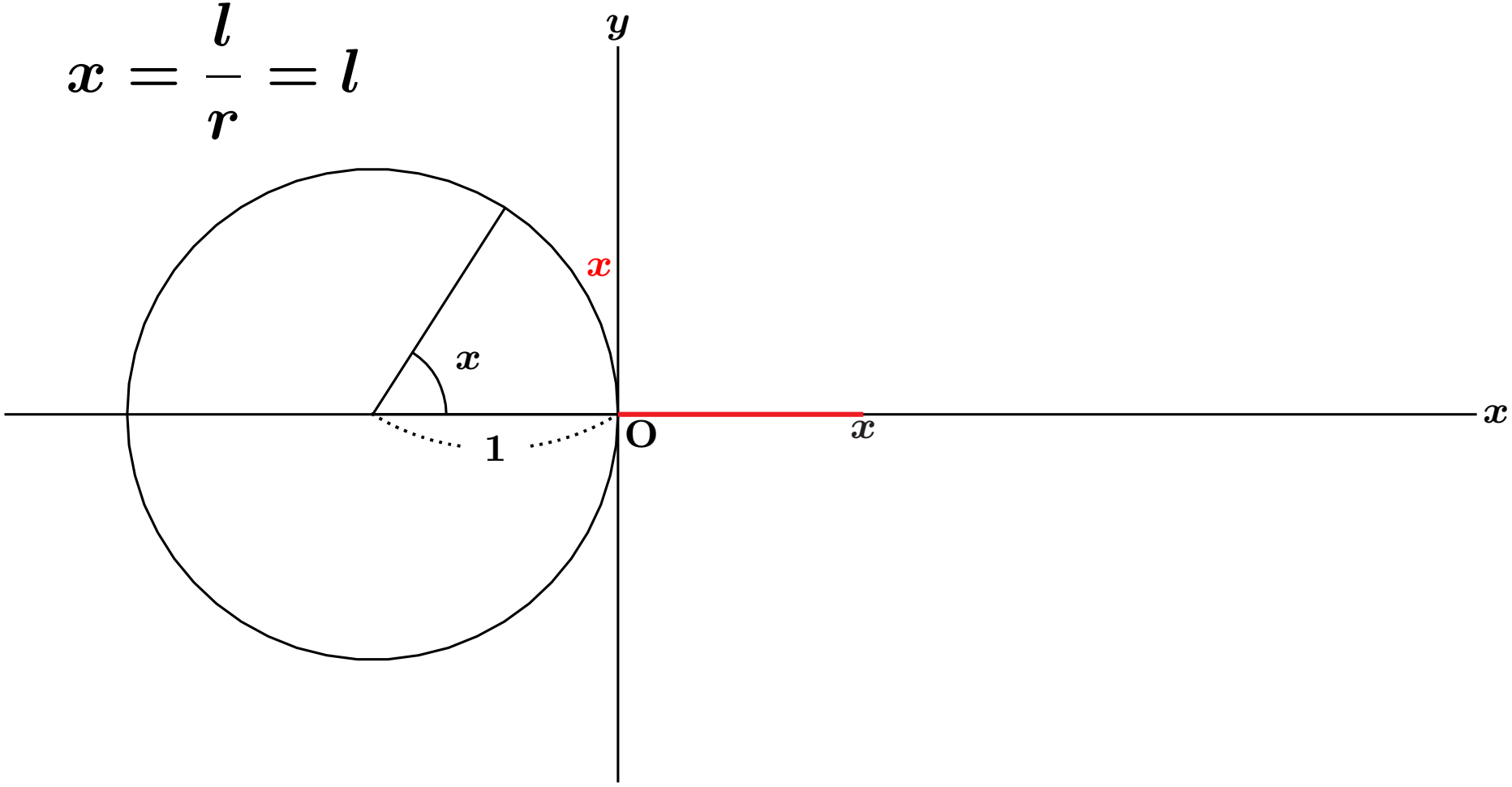
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



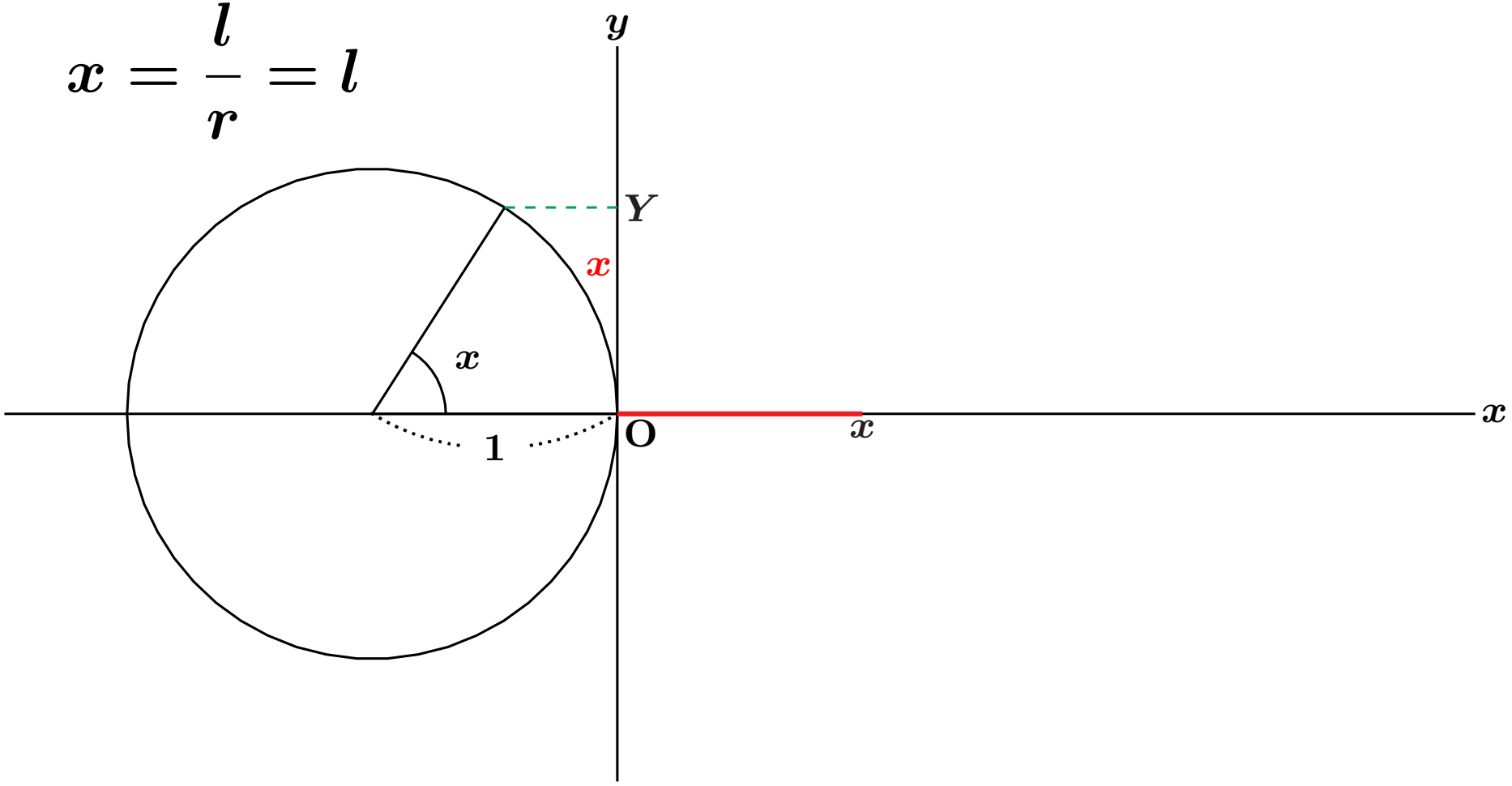
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



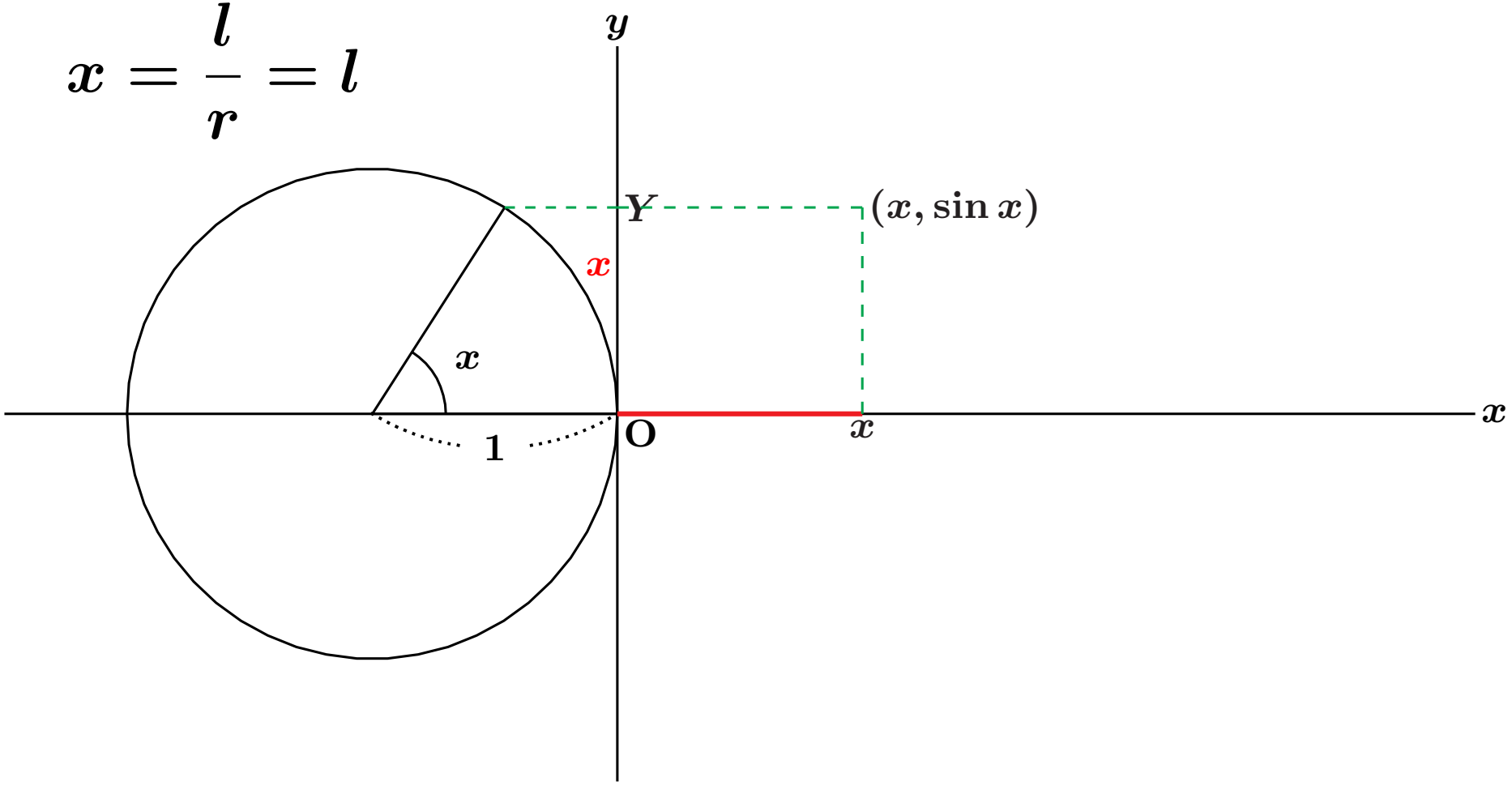
# Example of Flip Anime

$$x = \frac{l}{r} = l$$



# Example of Flip Anime

$$x = \frac{l}{r} = l$$



# CindyJS

- A group of Technical University of Munich has been developing CindyJS.

  CindyJS is a framework to create interactive (mathematical) content for the web. It aims to be compatible with Cinderella, providing an interpreter for the scripting language CindyScript as well as a set of geometric operations which can be used to describe constructions.

# Deveolpment of KETCindyJS

- Cinderella2 can export codes in CindyScripts and components in CindyScreen to a HTML file.
- CindyJS itself doesn't support KETCindy.
- We have developed KETCindyJS which make it possible to use many functions of KETCindy in the HTML file.

# Details of the development

- **We have developed a program to create a file contained of a list of data of functions, for example,**

  `Listplot,basic1,3995,4076,Divoptions, ...`

  **Here, basic1, 3995 and 4076 mean this function is written from line 3995 to line 4076 in library `basic1`. The subsequent is functions used in 'Listplot'.**

# Details of the development

- Pressing button 'KeTJS' for on-line mode or 'KeTJSoff' for off-line mode, KETCindy extracts all functions written in Cindy Scripts of the original HTML and adds them to HTML together with functions used in them.
- KETCindyJS modifies definitions or settings written in the HTML according to options described in 'Setketcindyjs'.

# Details of the development

- KETCindyJS supports animations.
- Buttons for animation are available.
- ‘Animationparam‘, ’Setketcindyjs’, ‘Ketcindyjs-data’ and ‘Textedit’ have been implemented.

# Demonstrations

- General Angle html
- Focus of Ellipse html
- Drawing Sine Curve htim
- Triangular Ratio html
- Atwood' Machine

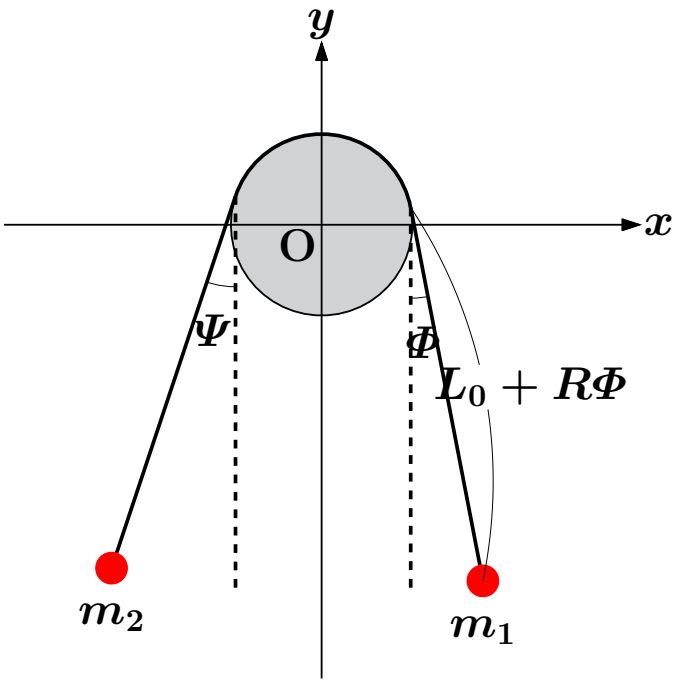
# An Atwood's machine

- A. Prokopenya in Poland visited Toho last year.
- He has been analyzing various Atwood's machines.
- He obtained:

$$\ddot{\Psi} = \frac{R\left(g\,(m_2 - \cos\Phi\, m_1) - \dot{\Phi}^2\,((\Phi-\Psi)\,R + L_0)\,m_1\right)}{R^2\,(m_2+m_1)+I_0}$$

$$\ddot{\Phi} = \frac{-\sin\Phi\, g + 2\,\dot{\Phi}\,\dot{\Psi}\,R - \dot{\Phi}^2\,R}{(\Phi-\Psi)\,R + L_0}$$

html



# KETCindyJS for education

- KETCindyJS has great potential to produce more interactive materials.
- As a result, to accelerate communication between teacher(s) and students in the classes.
- For now, KETCindyJS can not call a CAS, which is a future work for us.