

# KeTCindyJSの開発と教育利用

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## $K_{\text{ETpic}}, K_{\text{ETCindy}}, K_{\text{ETCindyJS}}$

- $K_{\text{ETpic}}$  は  $\text{T}_{\text{EX}}$  描画パッケージのプリプロセッサ  
 $\text{Tpict}$ ,  $\text{pict2e}$ ,  $\text{TikZ}$
- $K_{\text{ETCindy}} = K_{\text{ETpic}} + \text{Cinderella2}$
- $K_{\text{ETCindyJS}} = K_{\text{ETCindy}} + \text{CindyJS}$

# KeTCindy のインストール

- CTAN(Comprehensive T<sub>E</sub>X Archive Network) が KeTCindy をアップロード (2018)

ctan

- 「ctan>ketcindy」で検索
- KeTCindy(-master) にある readme.pdf に従ってインストール
- KeTCindyReference(E,J) や iBook もある

# KeTCindy page in CTAN

## ketcindy – Creating graphics for $\text{\TeX}$ using Cinderella

KeTCindy combines a plugin to Cinderella with free mathematical software (R, Maxima, ...) to produce high-quality  $\text{\LaTeX}$  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](#)

[Reference manual \(English\)](#)

[Reference manual \(Japanese\)](#) •

[User guide \(English\)](#)

[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

[MiKTeX](#) as ketcindy

Topics [Graphics](#)

[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!

## 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 geometric figures](#)
- [pst-eucl: Euclidian geometry with PSTricks](#)

## Rating Summary

☆☆☆☆☆

∅ 0 [No votes]

This package has not been rated yet. You can be the first one!

## My Rating

Only [registered](#) and authenticated members may vote. Please

## Package Links

[Home page](#)

[Support](#)

[Bug tracker](#)

[Repository](#)

## KETCindy の機能拡張

- Beamer より簡単なスライド作成機能 ‘KeTslide’
- Maxima や R の呼び出し機能
- 隠線処理 (3D) を高速化する gcc の呼び出し機能.
- CindyJS からできる html に KETCindy の関数などを追加する機能

## KETCindy の Web サイト

- 「samples ketcindy」 で検索  
[https://s-takato.github.io/ketcindysample/  
samples of ketcindy](https://s-takato.github.io/ketcindysample/samples%20of%20ketcindy)
- いろいろな例がアップされている

## K<sub>E</sub>T CindyJS の開発

- Cinderella2 は CindyJS のスクリプトを出力できる
- CindyJS 自体は, K<sub>E</sub>T Cindy をサポートしていない
- Cinderella が出力する HTML に K<sub>E</sub>T Cindy の関数を追加できるようにした
- K<sub>E</sub>T CindyJS は, off line でも KaTeX を使える  
(長坂さん, 北本さん)

## 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, K<sub>ET</sub>Cindy extracts all functions written in Cindy Scripts of the original HTML and adds them to HTML together with functions used in them.
- K<sub>ET</sub>CindyJS modifies definitions or settings written in the HTML according to options described in ‘Setketcindyjs’.

## Details of the development

- KETCindyJS supports animations.
- Buttons for the animation can be added.
- Function to add Input boxes has been supported.
- 'Animationparam', 'Setketcindyjs', 'Ketcindyjs-data' and 'Textedit' have been implemented.

## 教材例

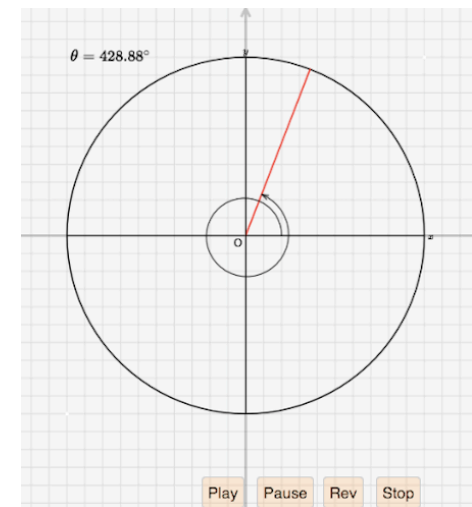
- 一般角
- 三角関数のグラフ
- 楕円の焦点
- Hypotrochoid
- 立方体の回転
- 最速降下曲線
- Atwood's machine

# 一般角

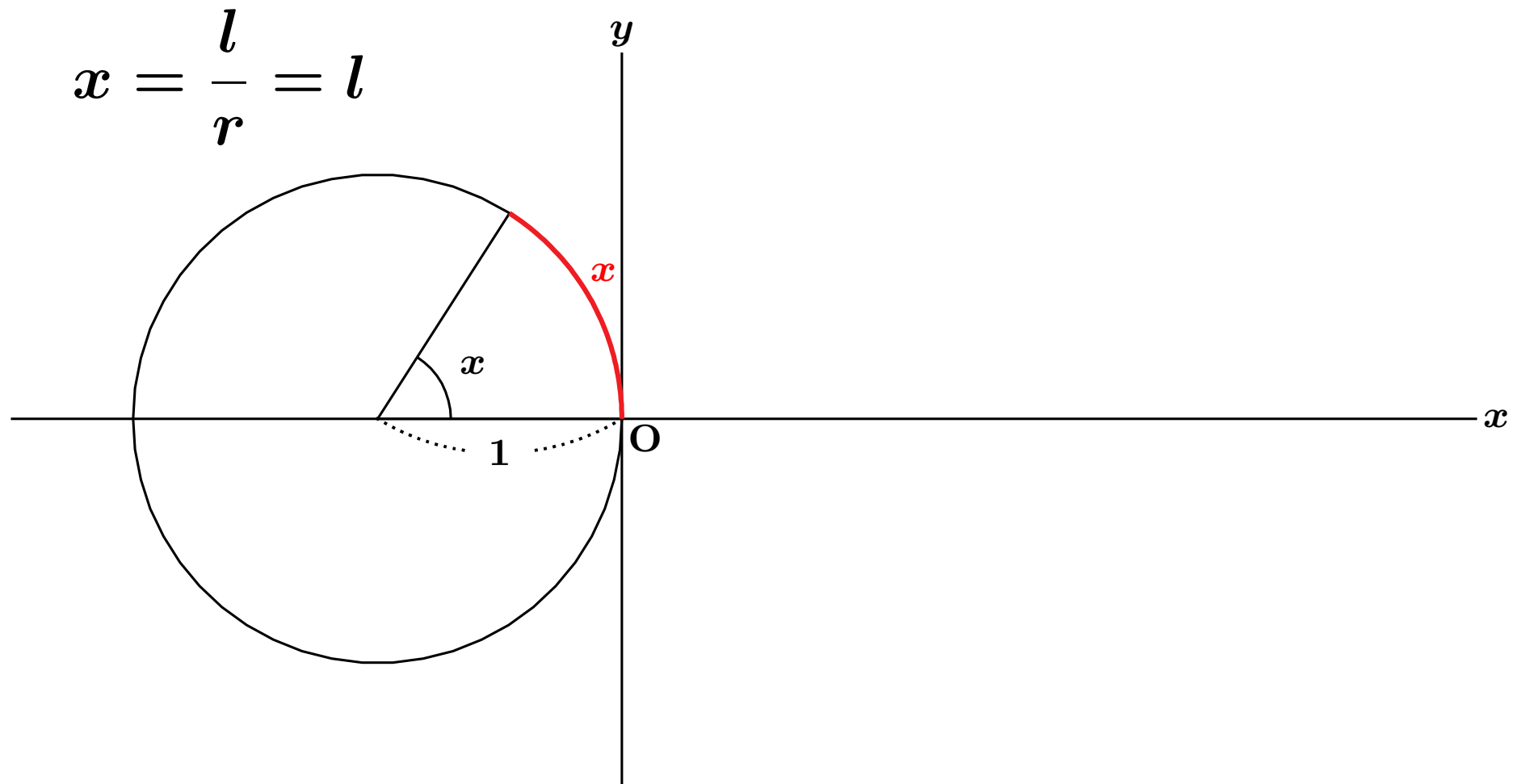
- スクリプト (一部)

```
an=Animationparam(0,60,[-100000,100000]);  
th=an*pi/180;  
fun="(0.5+0.1*abs(t)/(2*pi))*[cos(t),sin(t)]";  
rng=Assign("t=[0,th]",["th",th]);  
Paramplot("1",fun,rng);
```

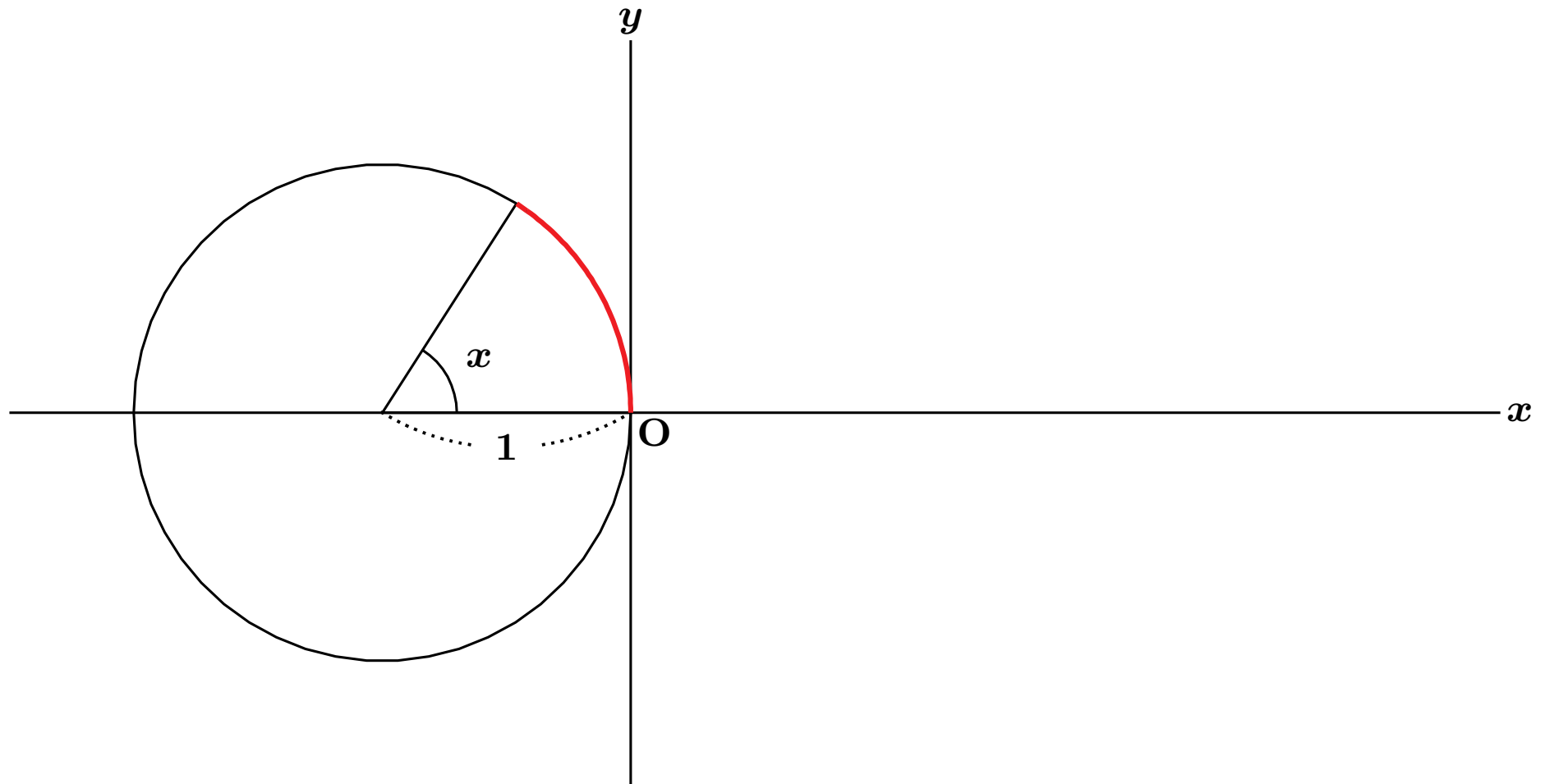
- s0611generalangle



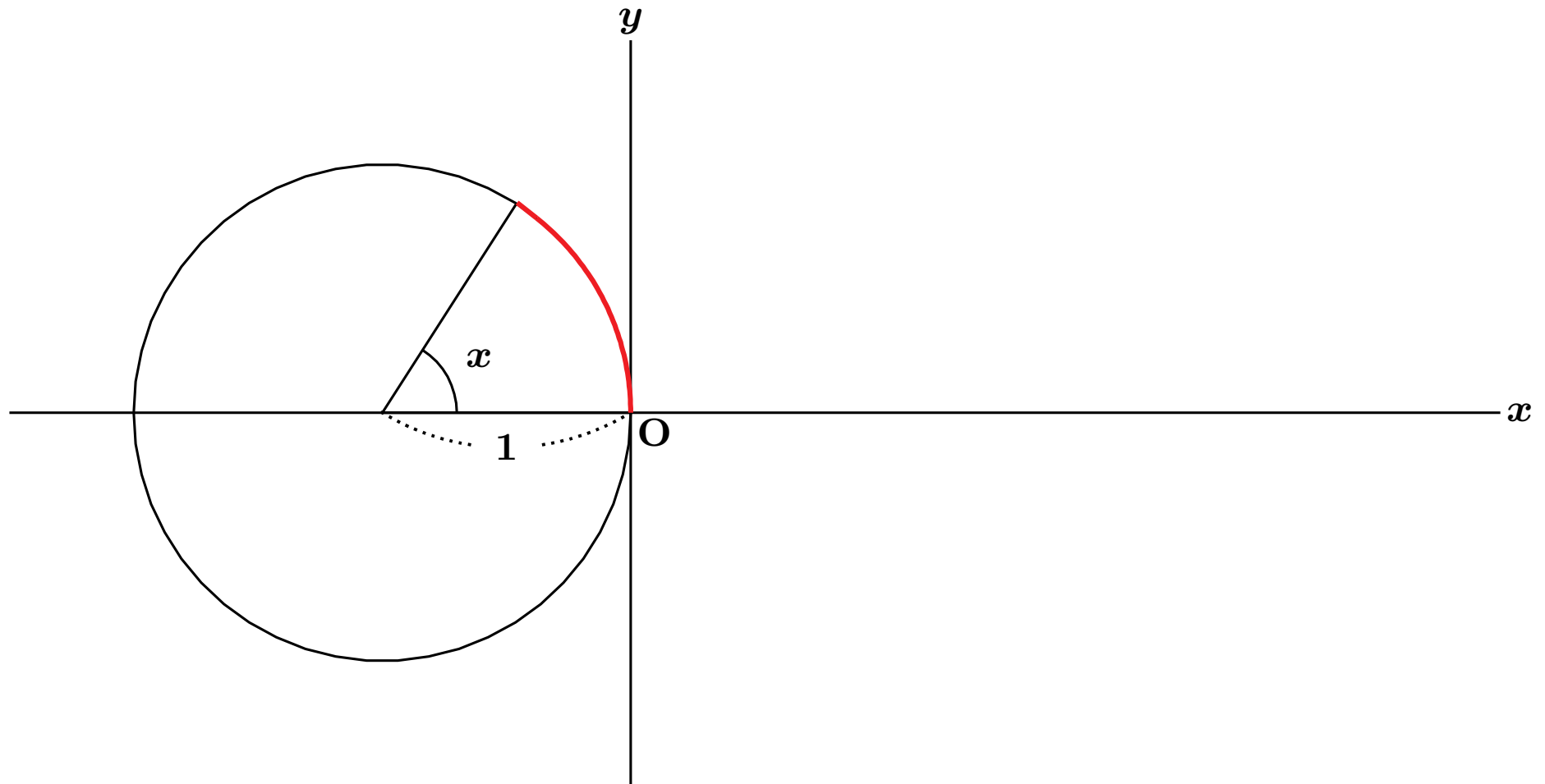
# $y = \sin x$ のグラフのかき方



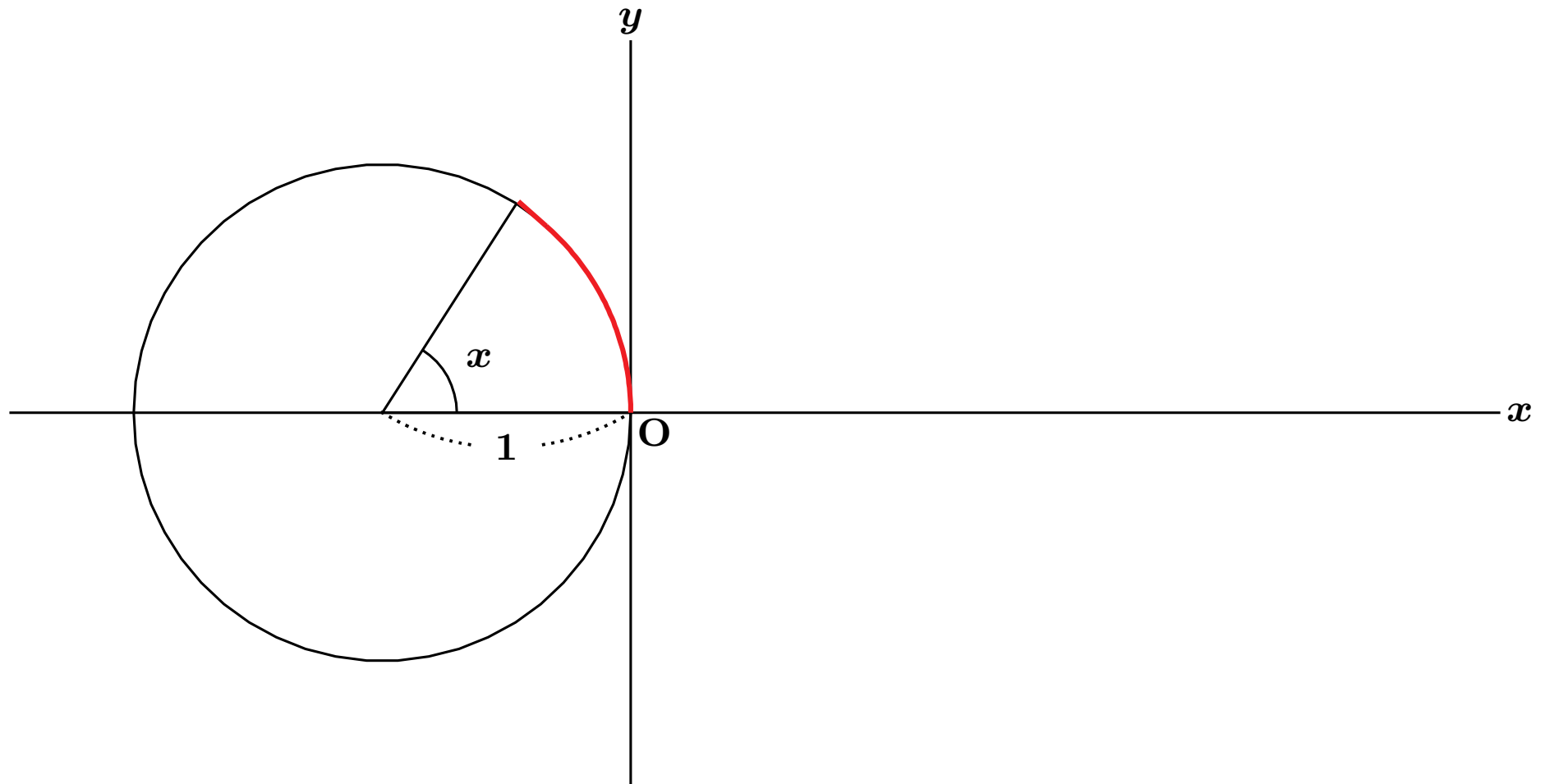
# $y = \sin x$ のグラフのかき方



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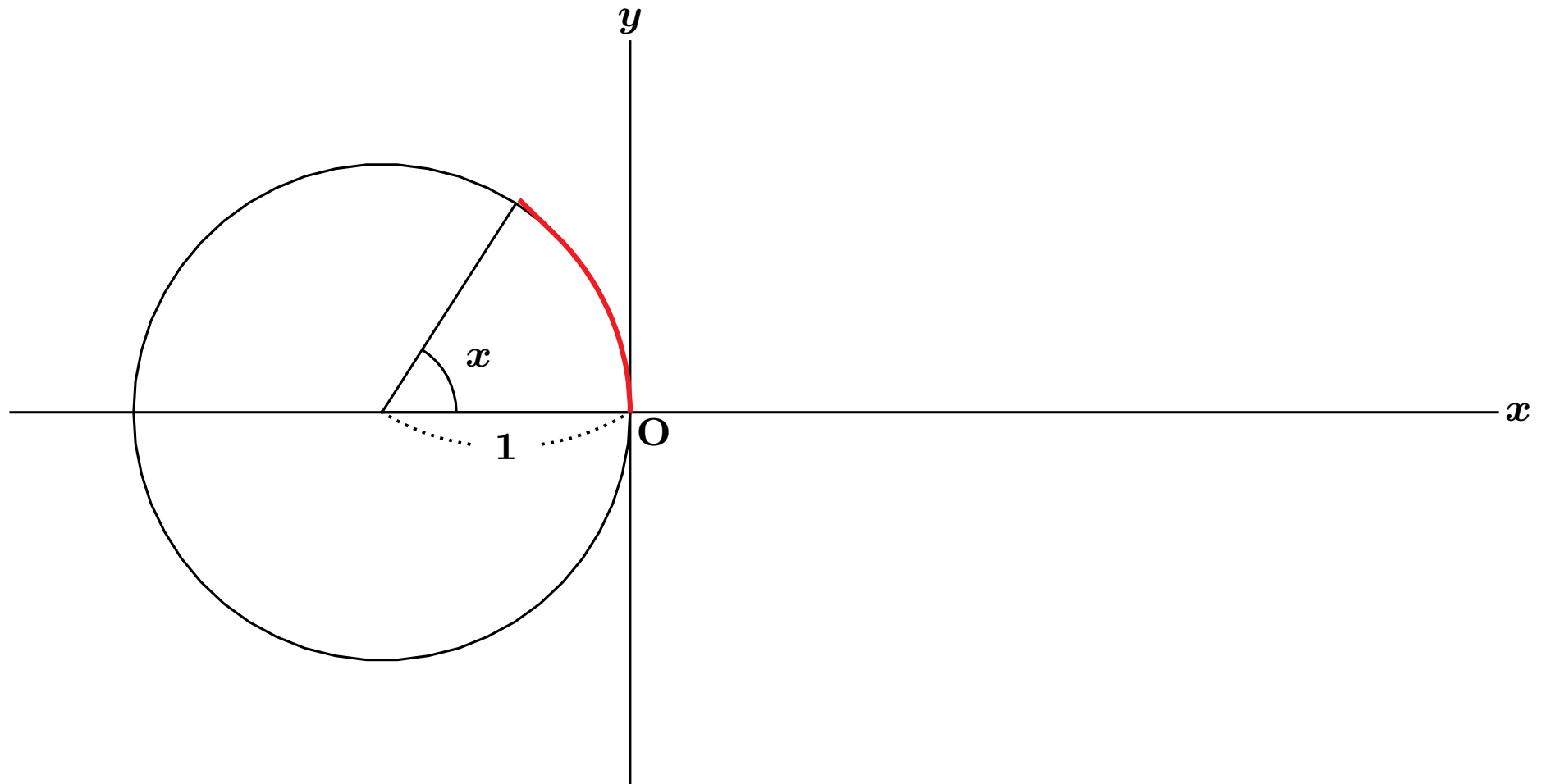


# $y = \sin x$ のグラフのかき方

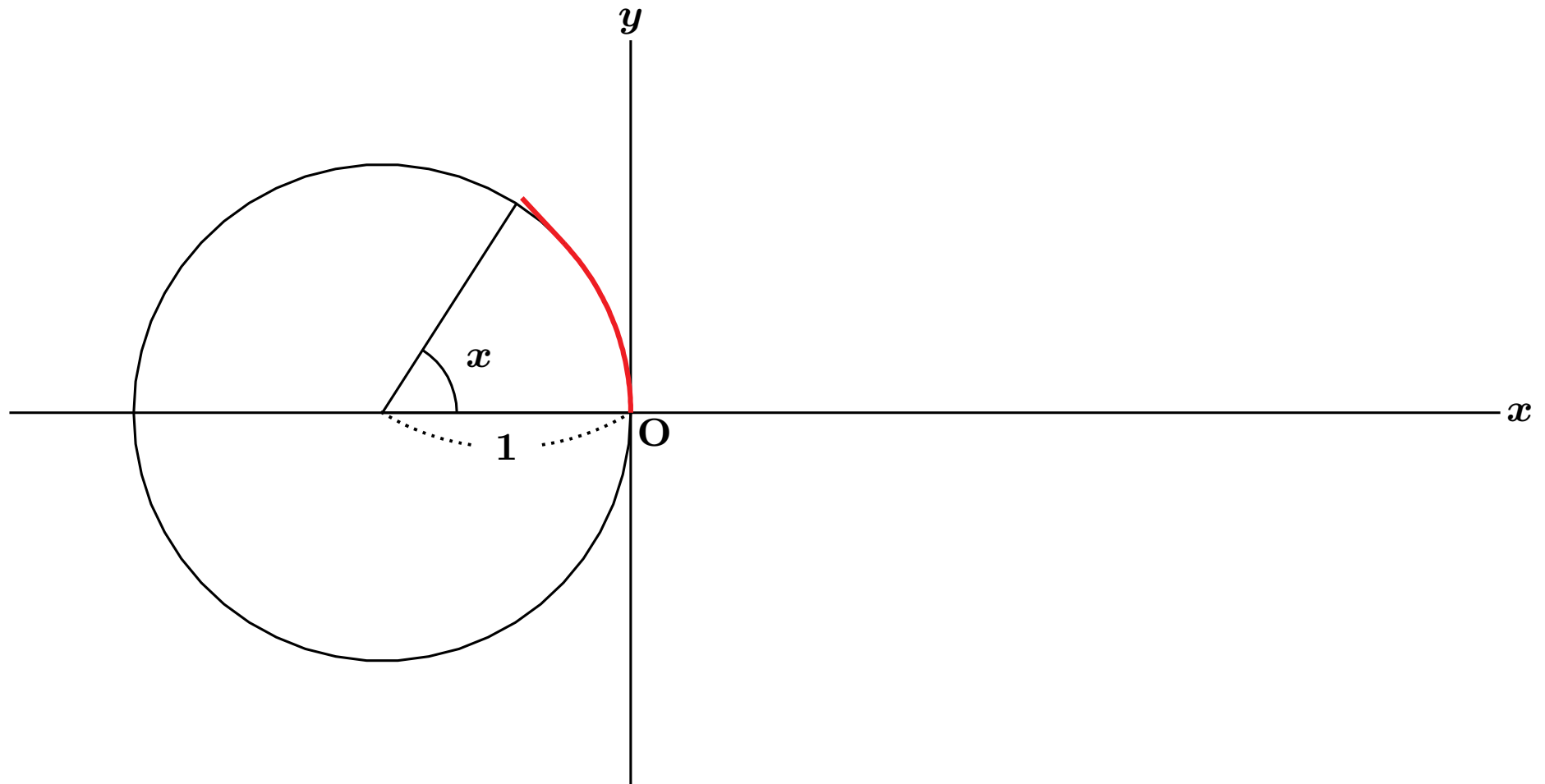




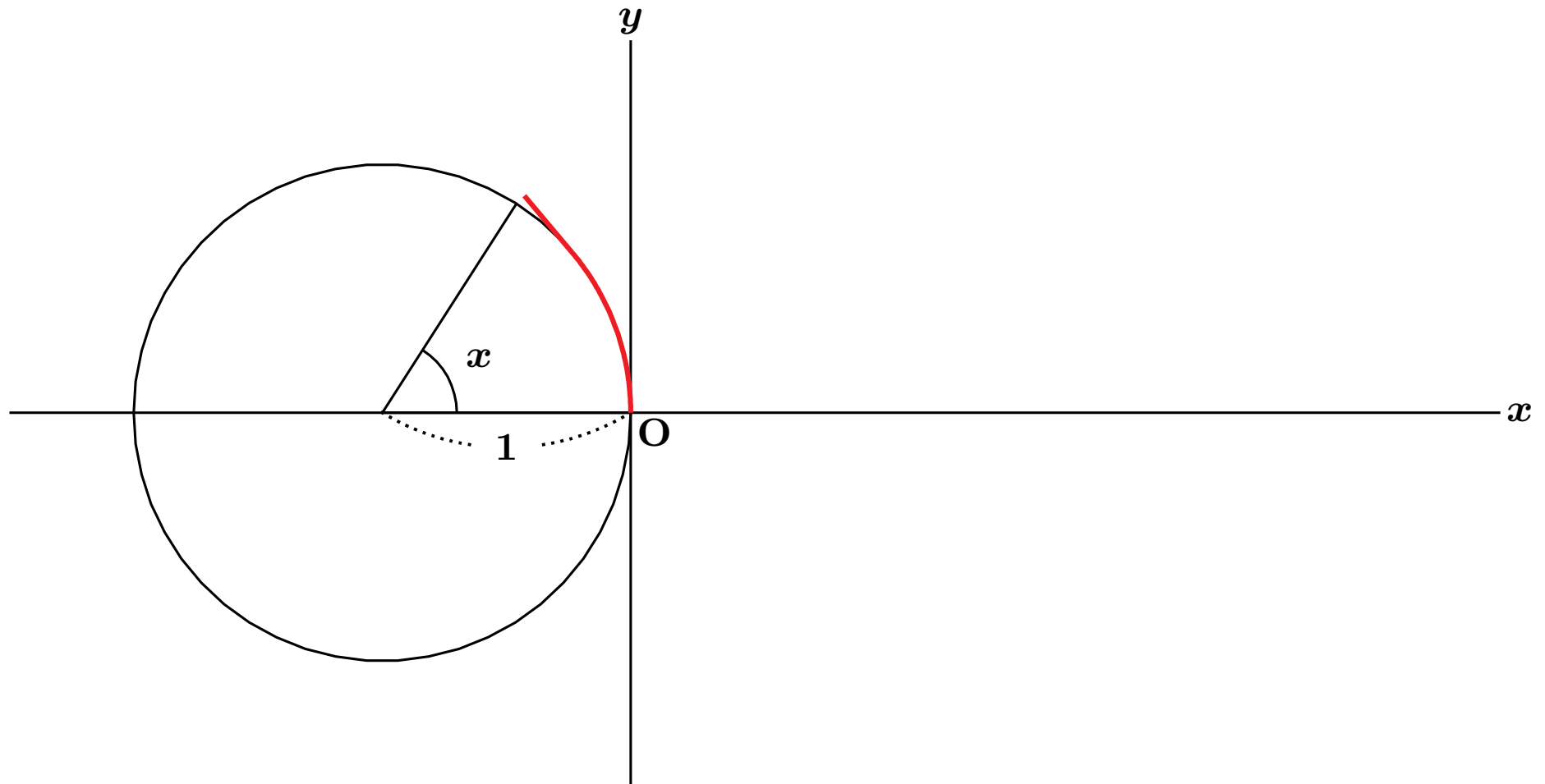
# $y = \sin x$ のグラフのかき方



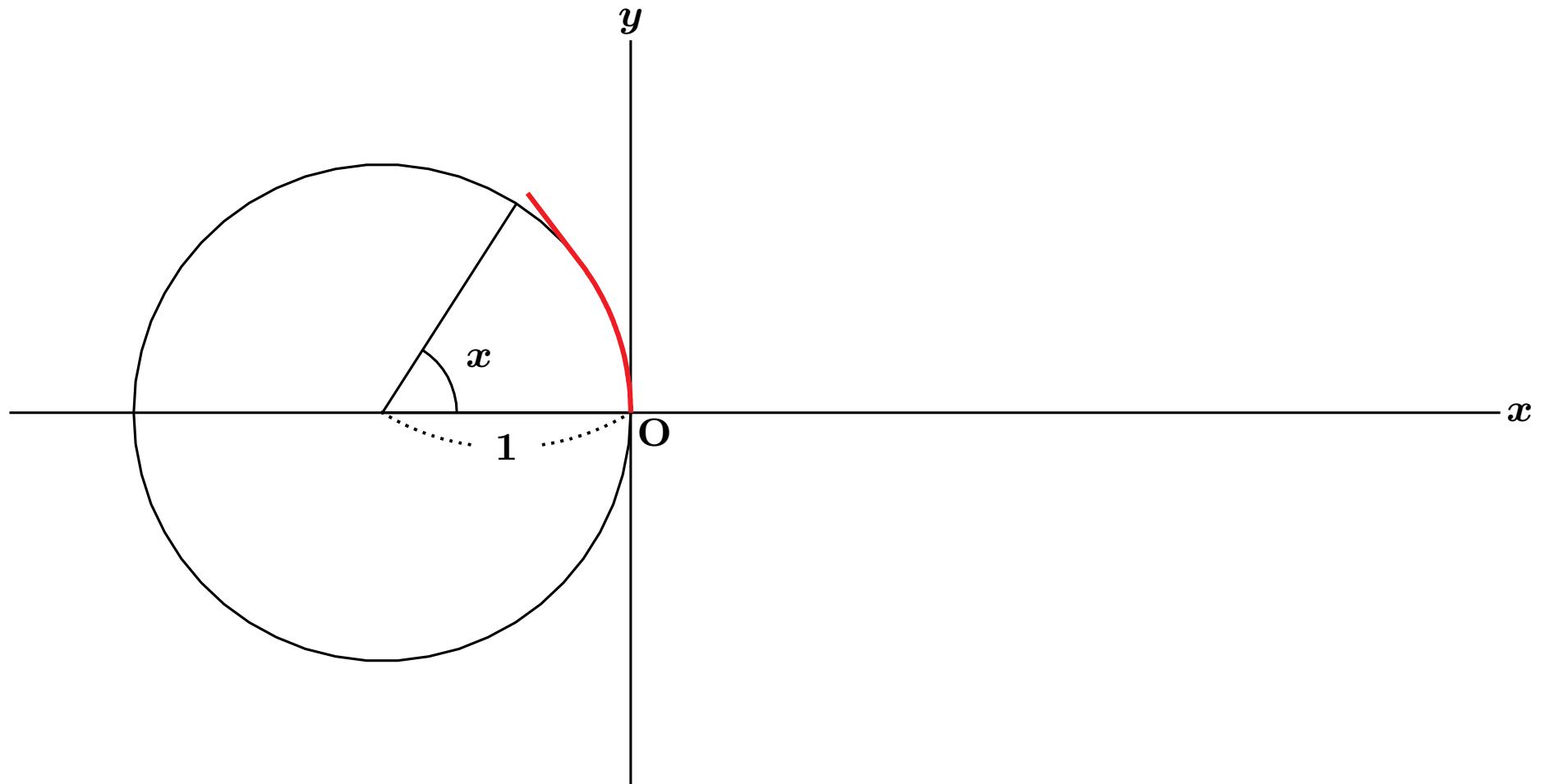
# $y = \sin x$ のグラフのかき方



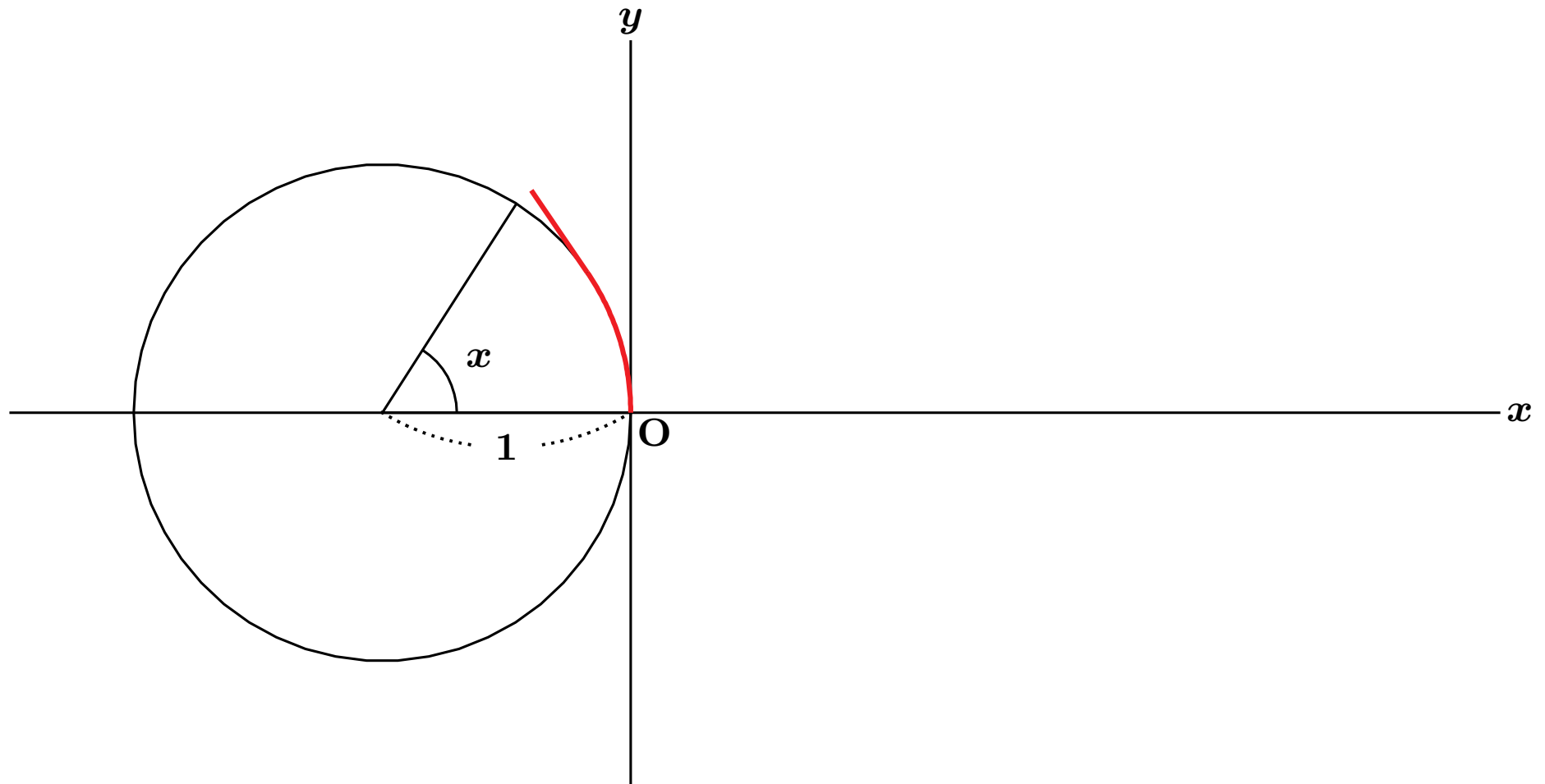
# $y = \sin x$ のグラフのかき方



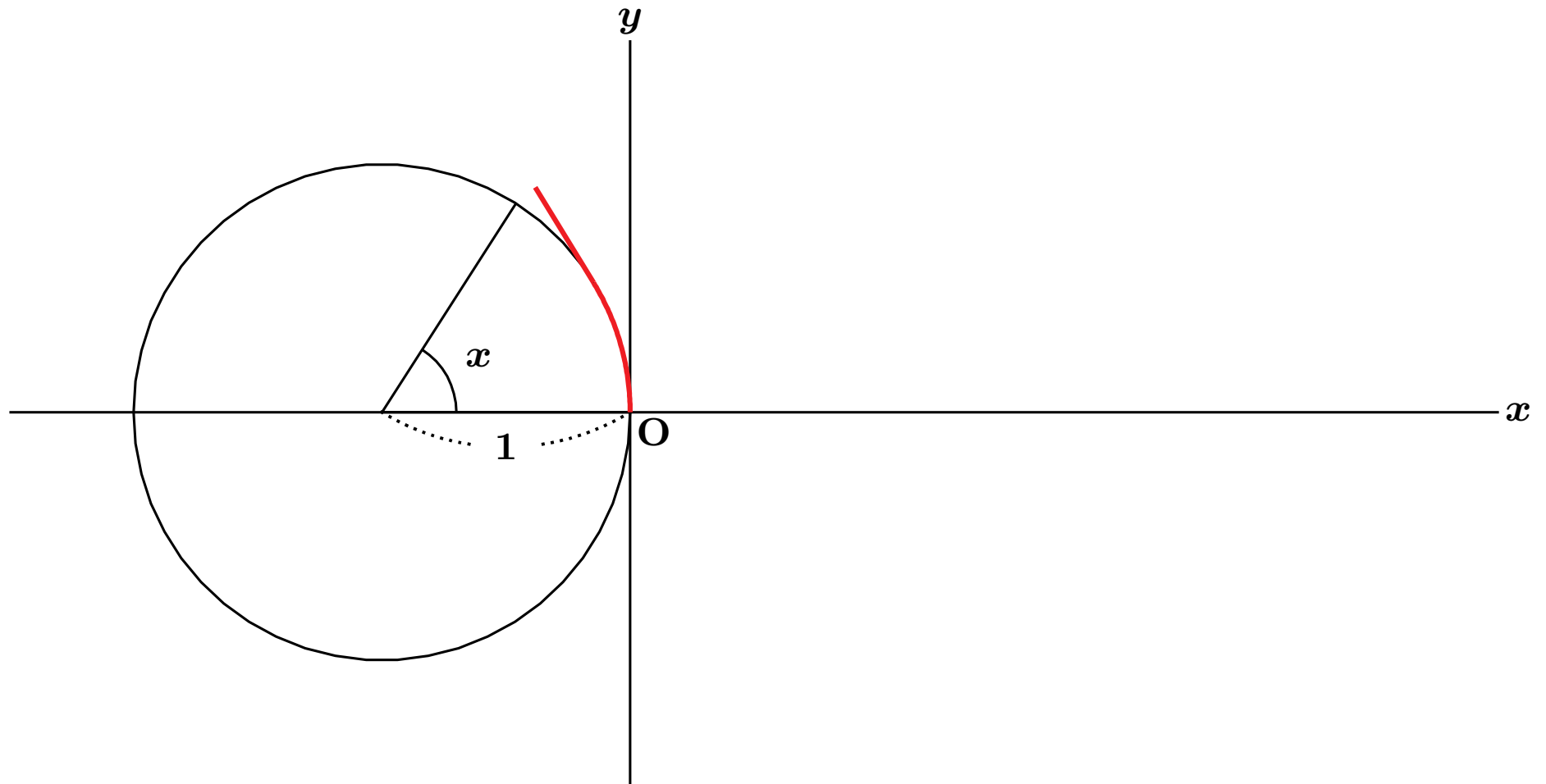
# $y = \sin x$ のグラフのかき方



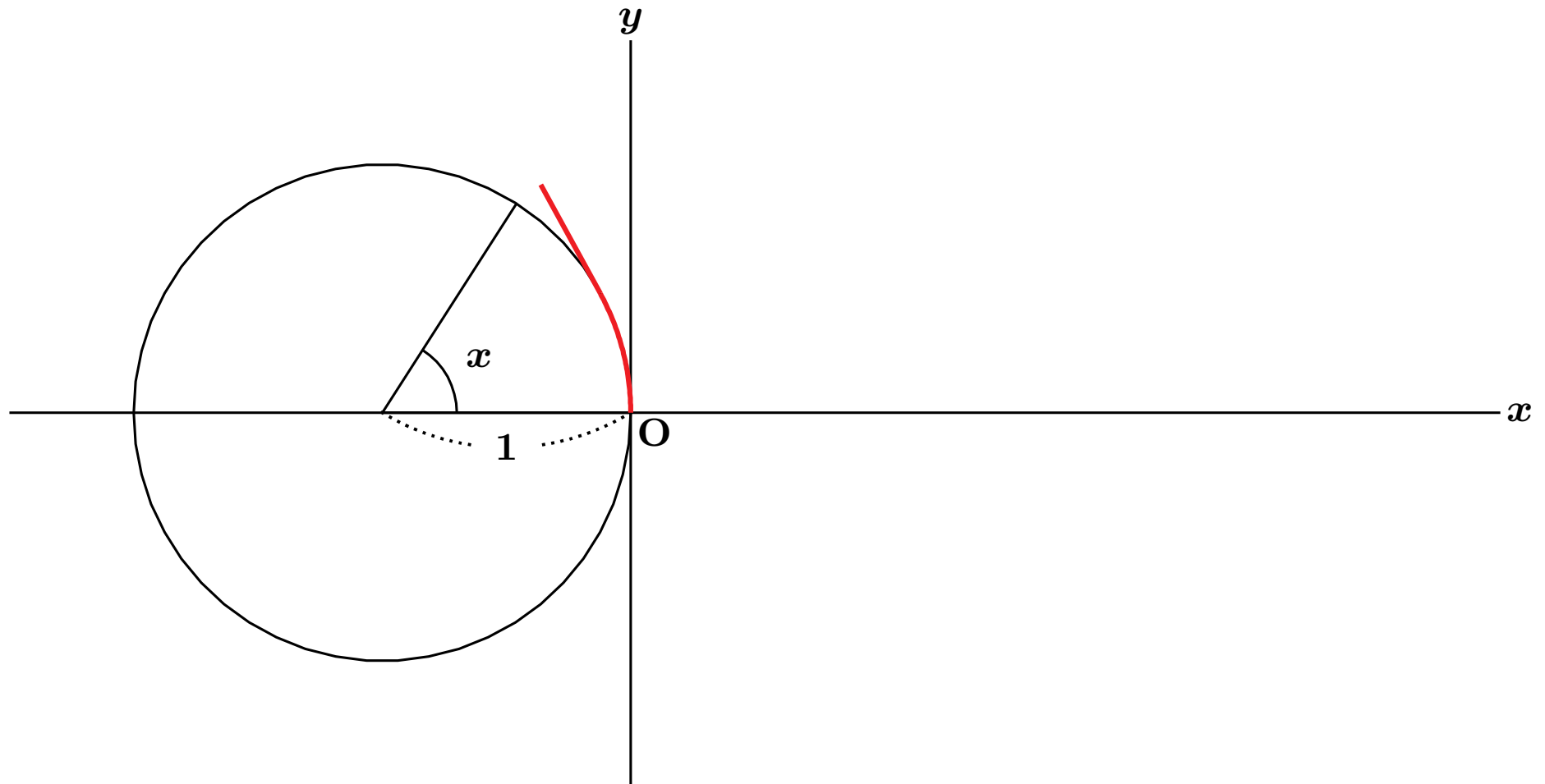
# $y = \sin x$ のグラフのかき方



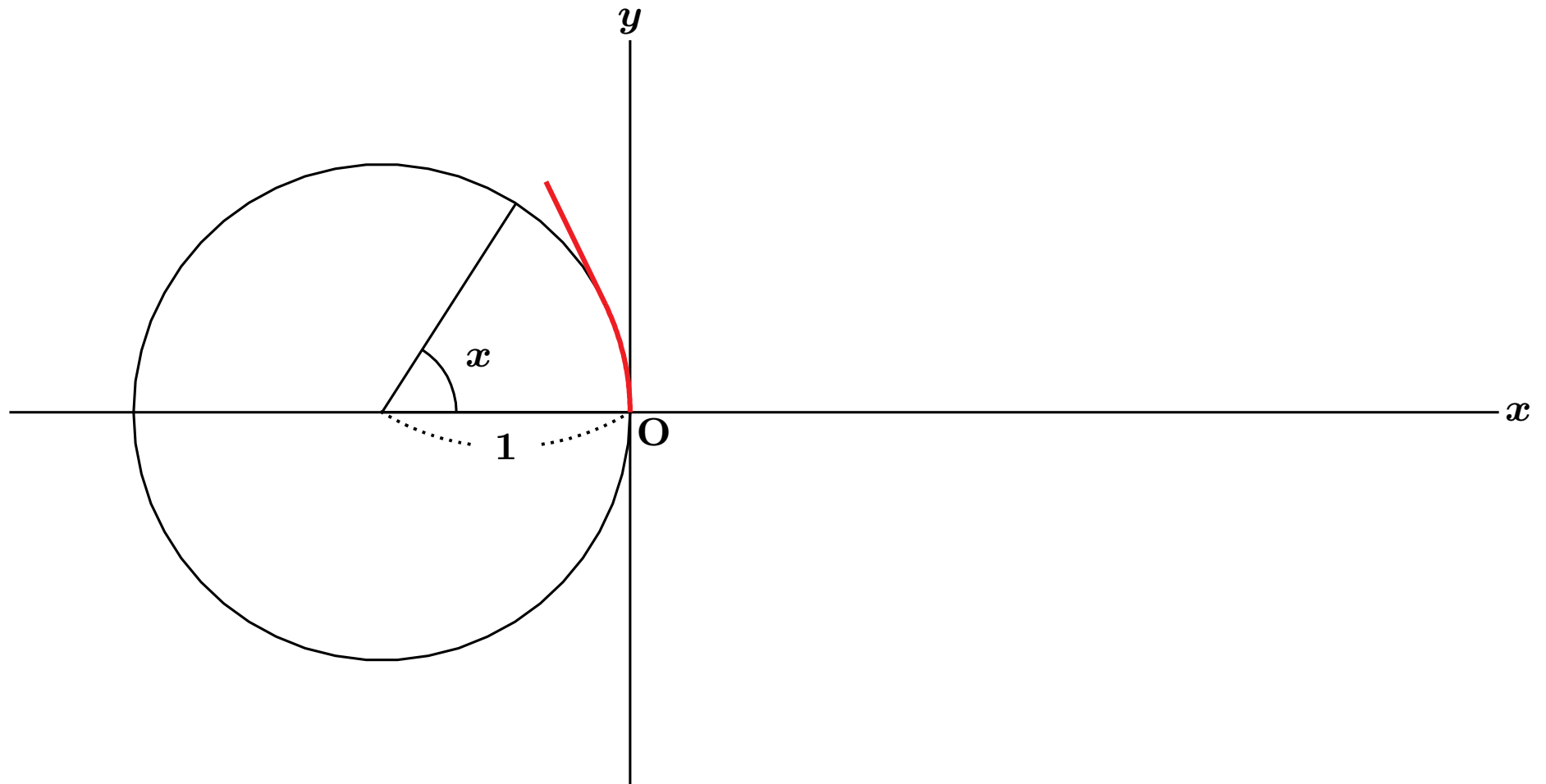
# $y = \sin x$ のグラフのかき方



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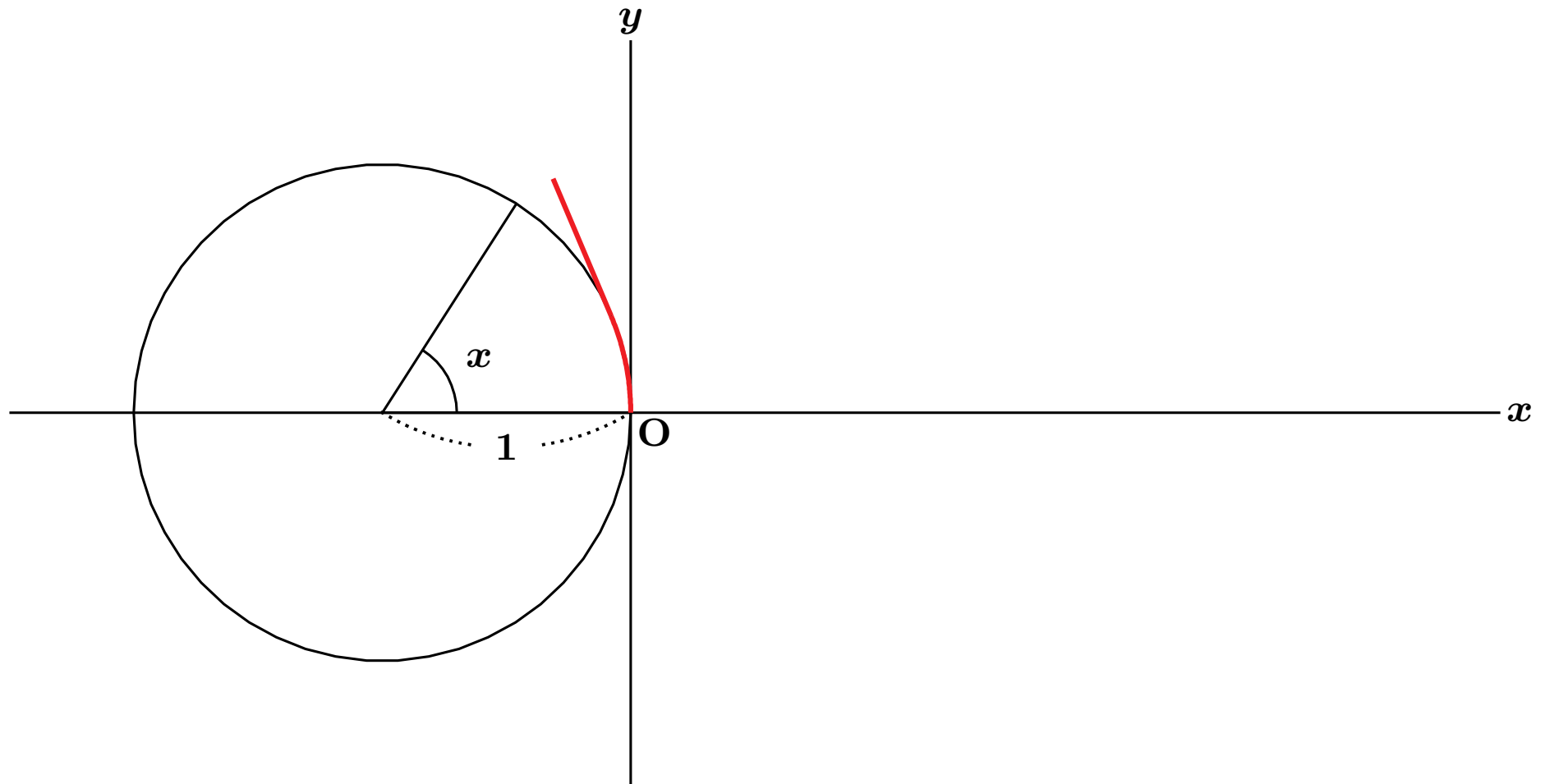


# $y = \sin x$ のグラフのかき方

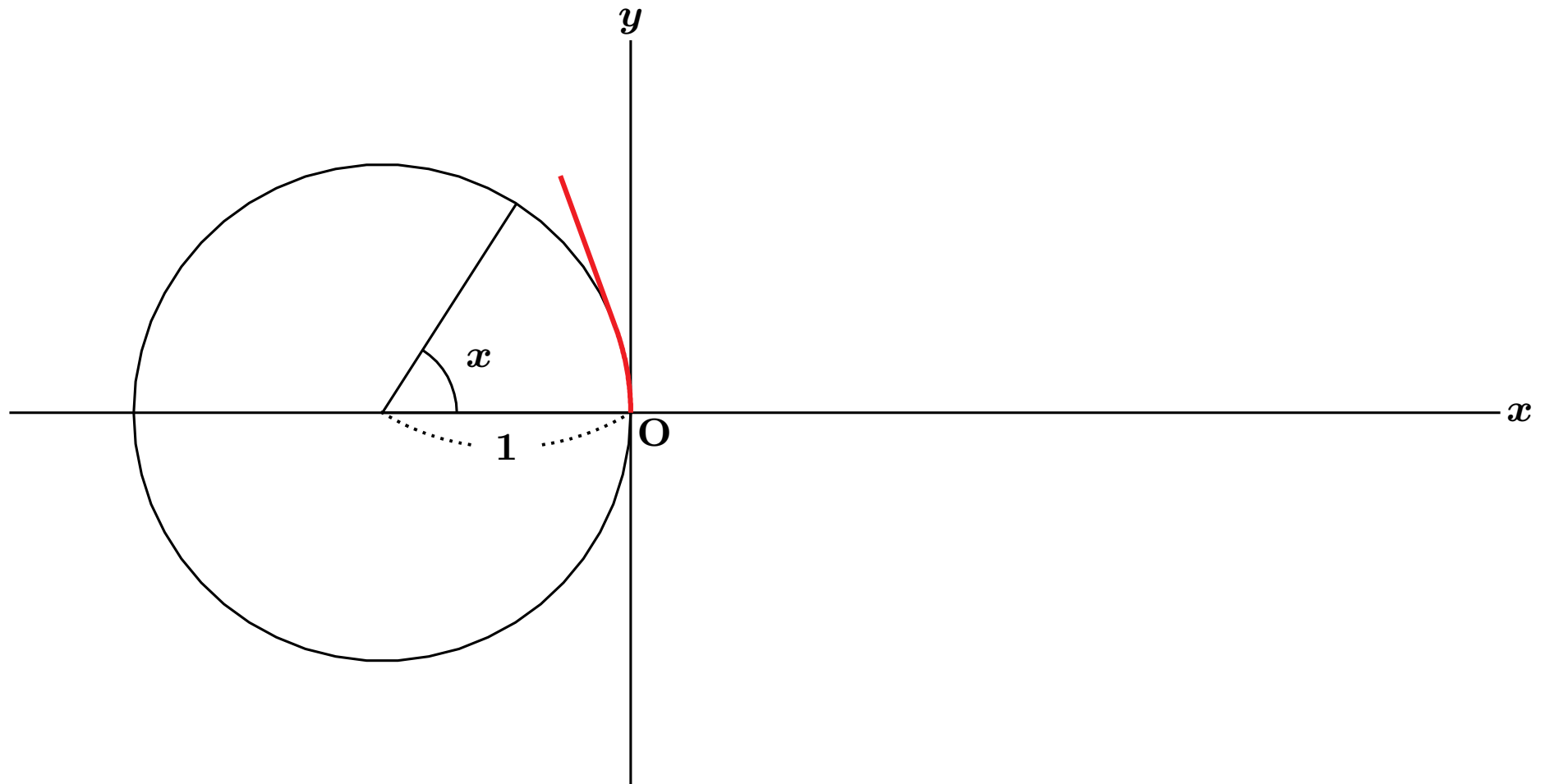




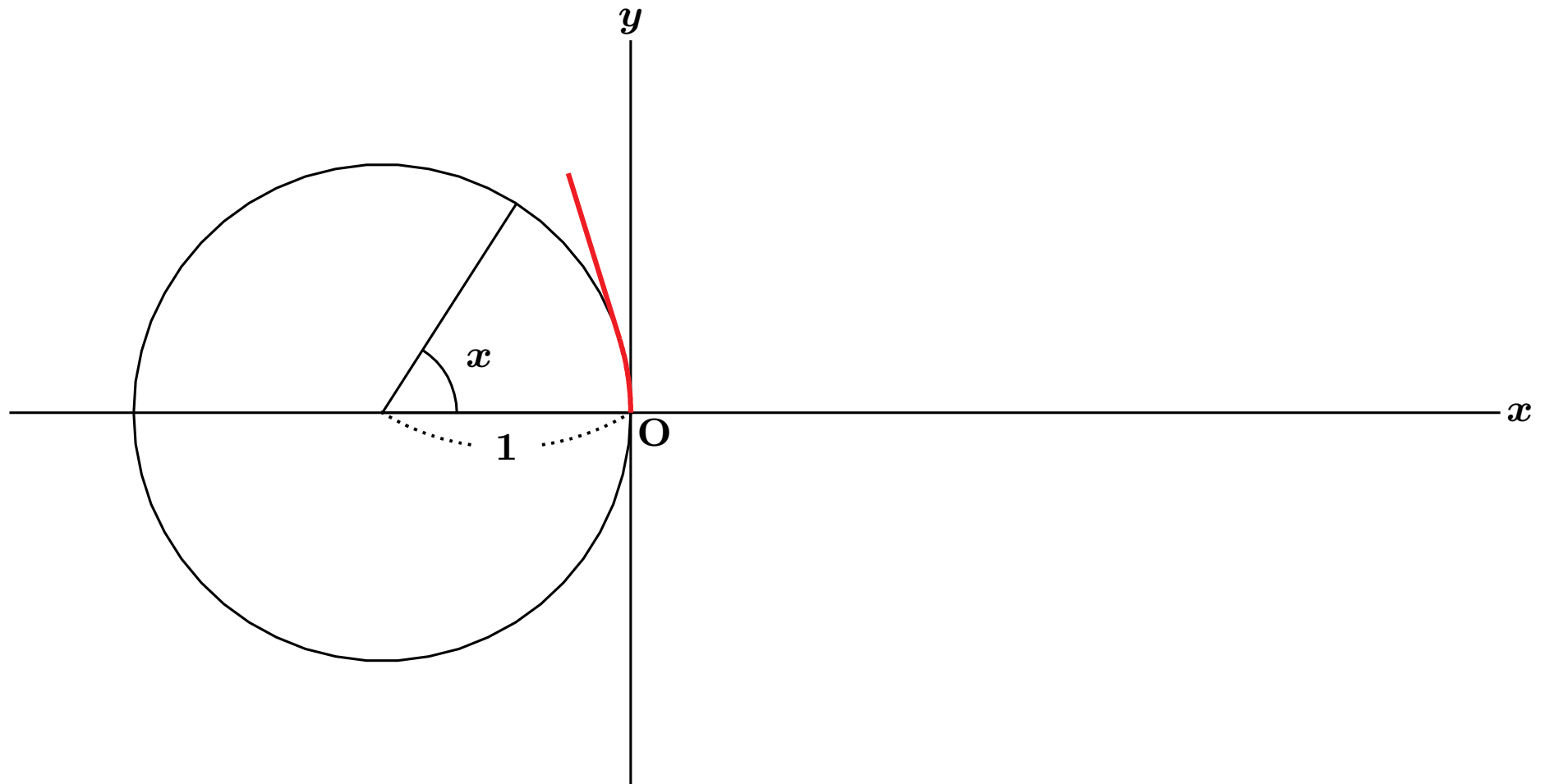
# $y = \sin x$ のグラフのかき方



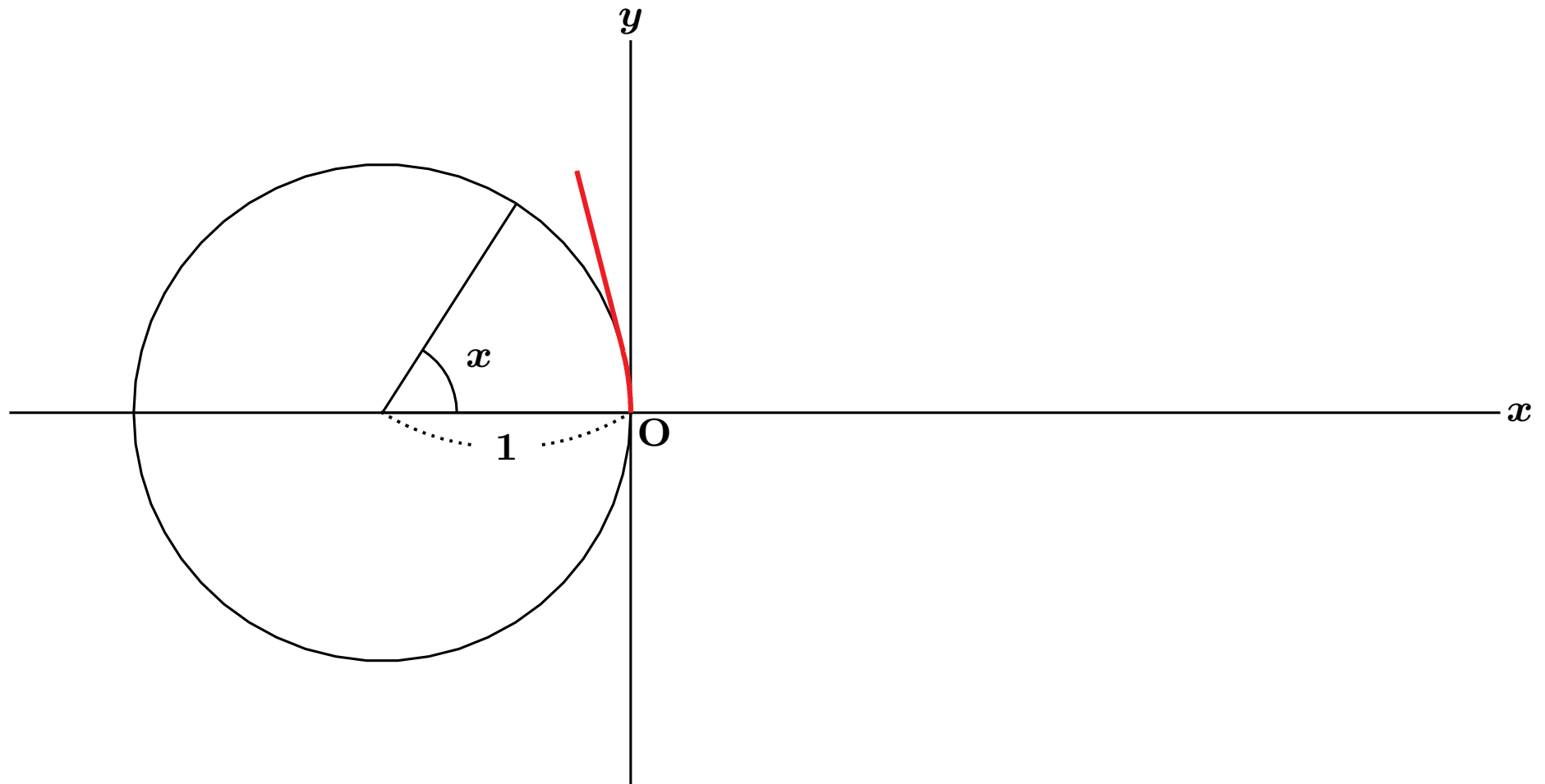
# $y = \sin x$ のグラフのかき方



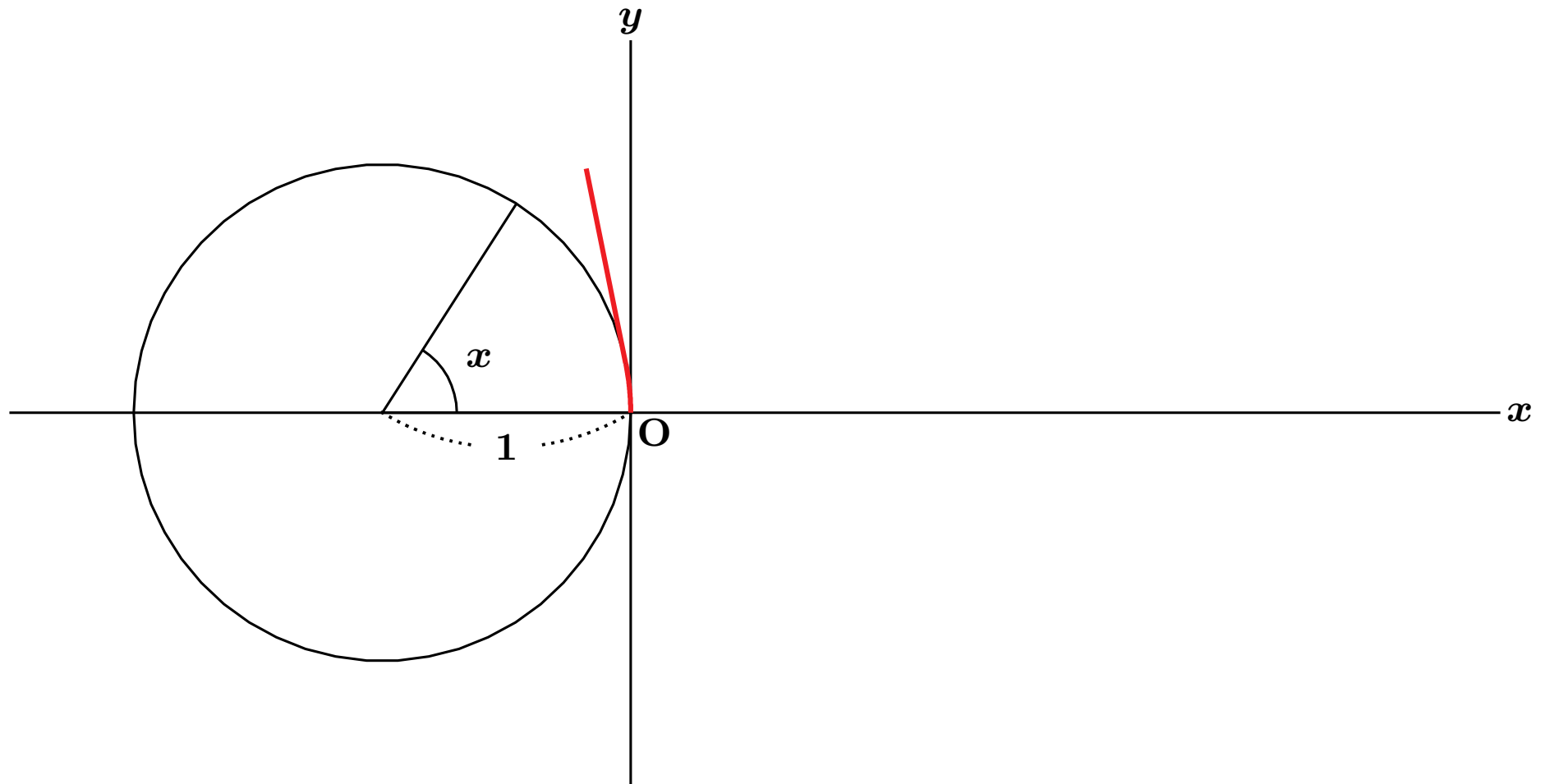
# $y = \sin x$ のグラフのかき方



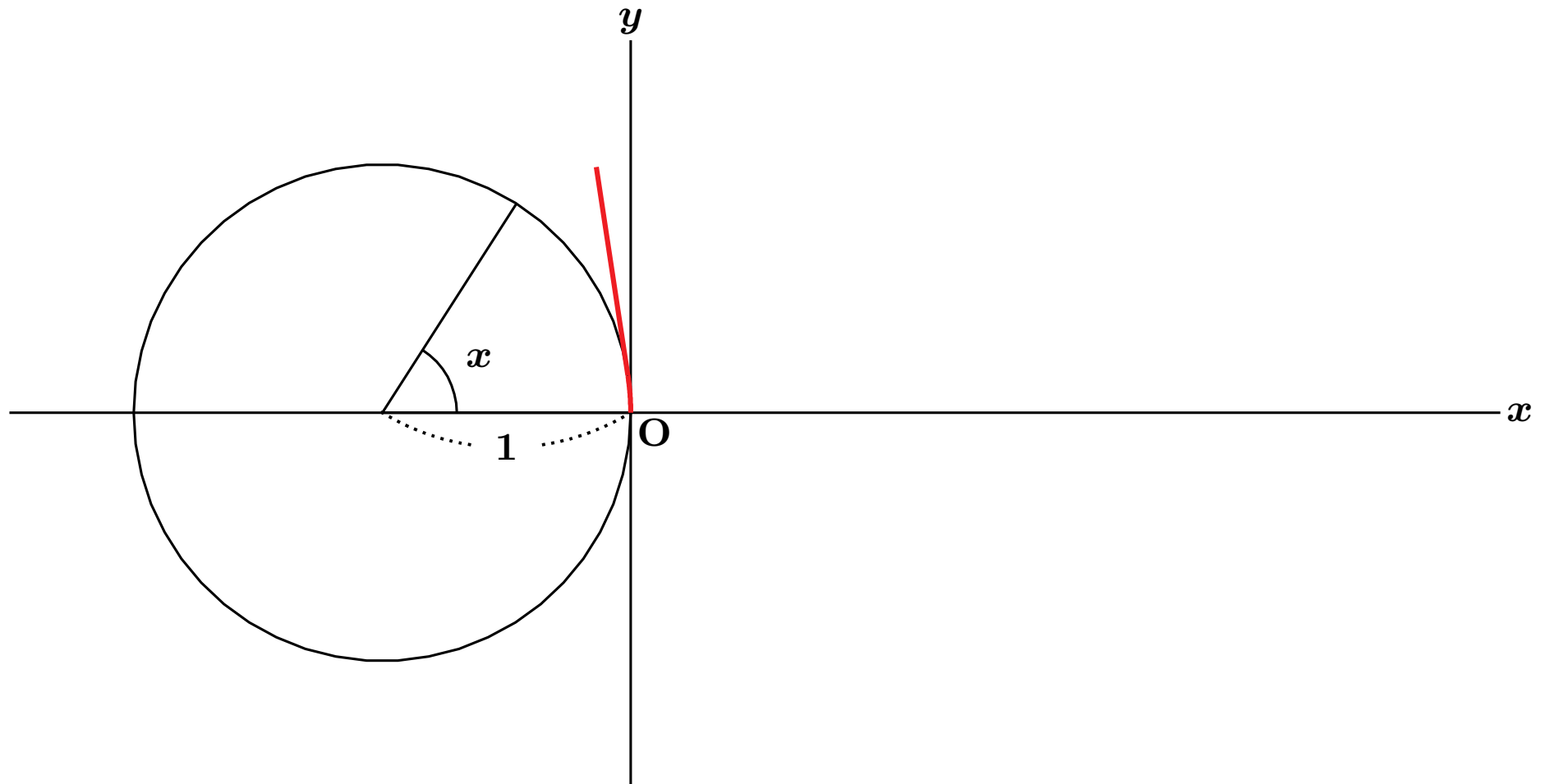
# $y = \sin x$ のグラフのかき方



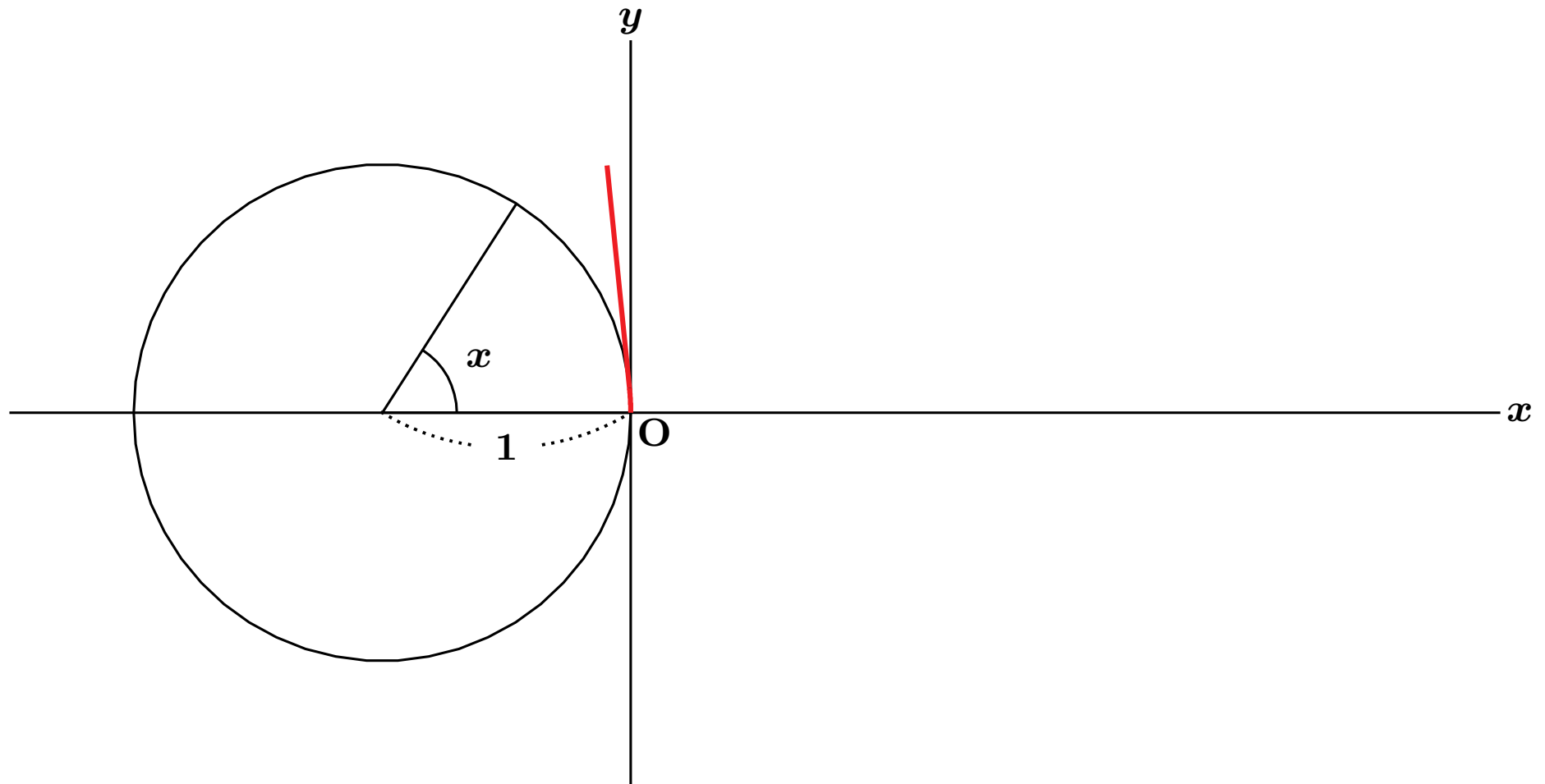
# $y = \sin x$ のグラフのかき方



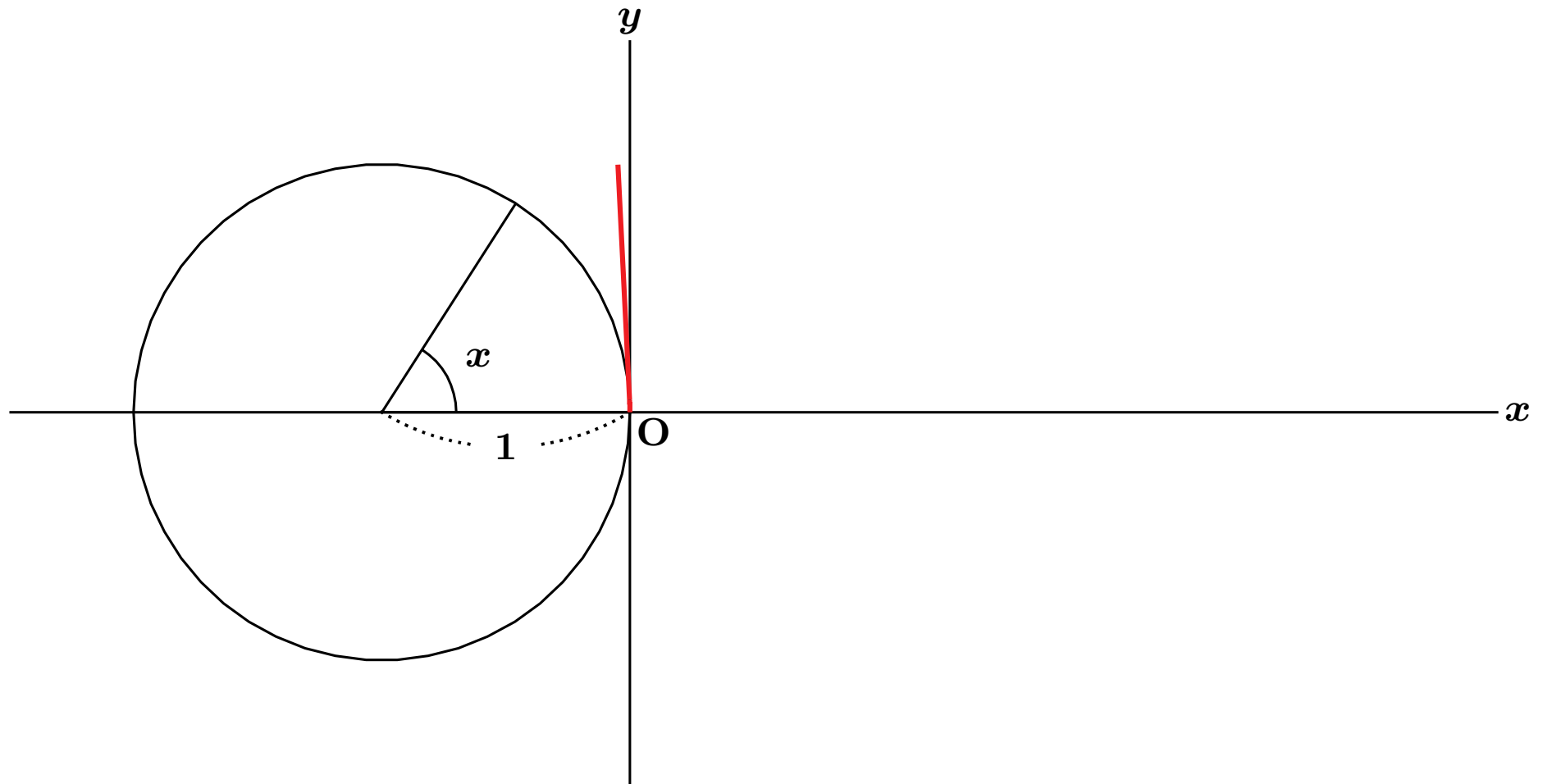
# $y = \sin x$ のグラフのかき方



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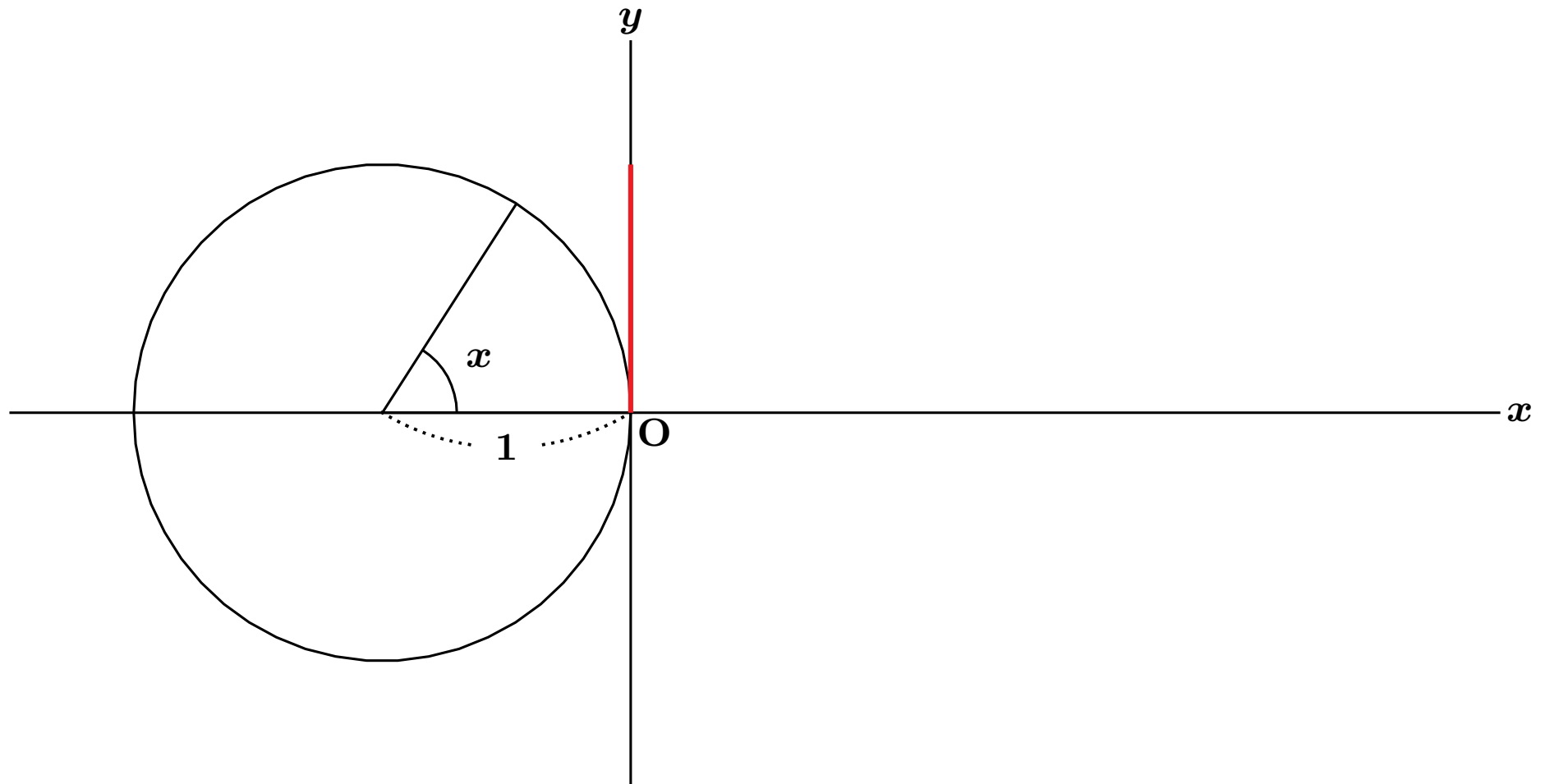


# $y = \sin x$ のグラフのかき方

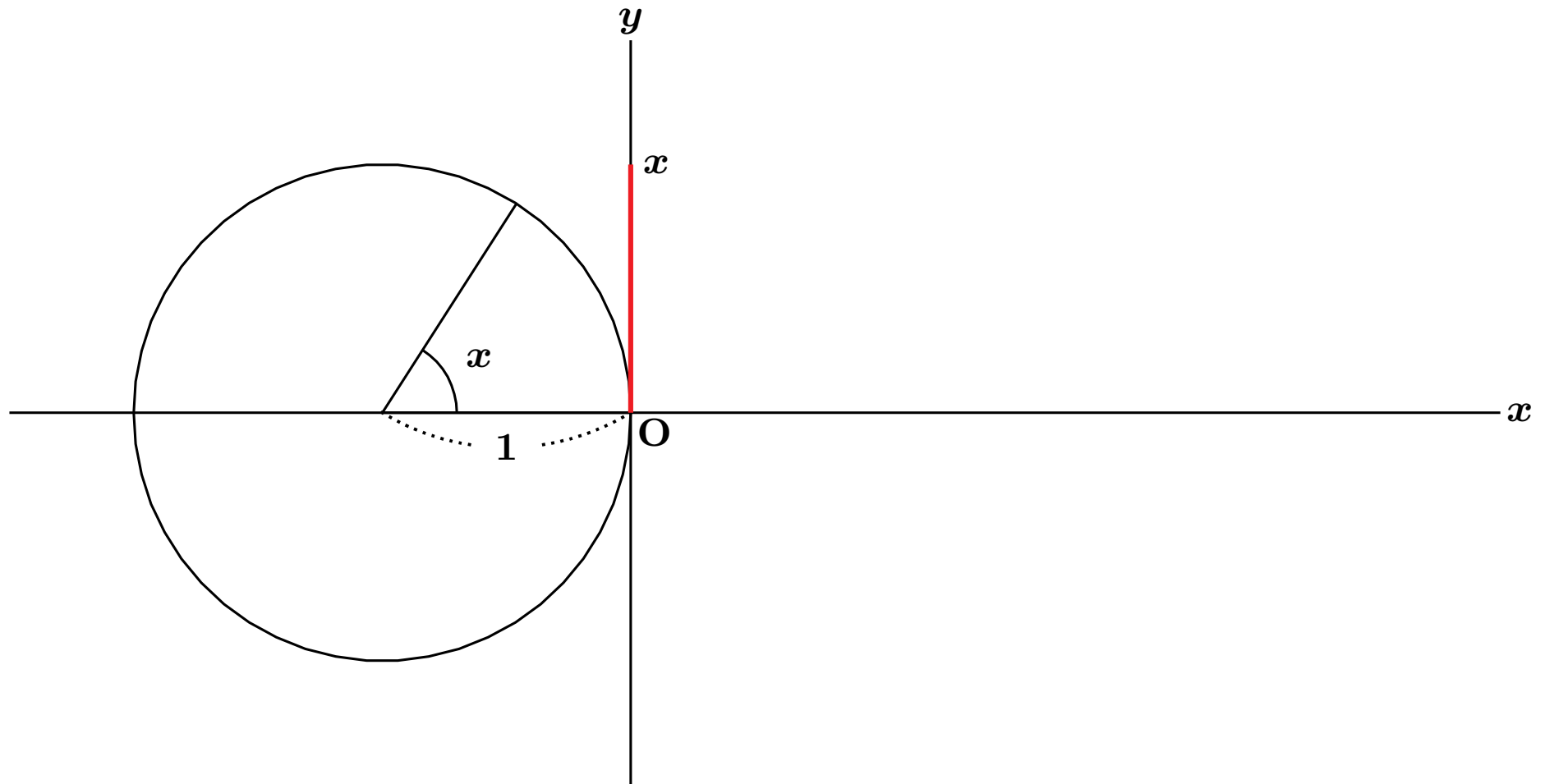




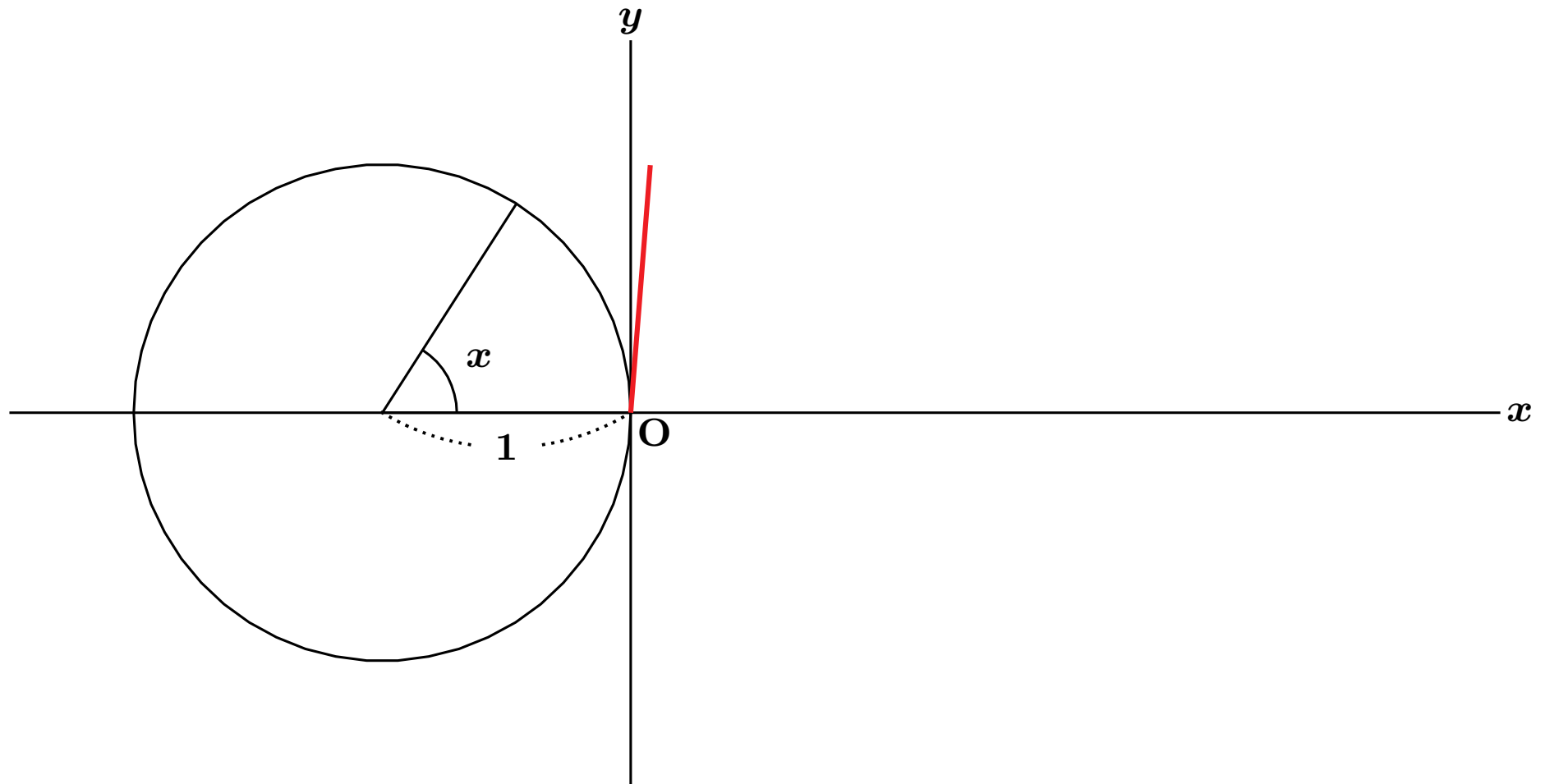
# $y = \sin x$ のグラフのかき方



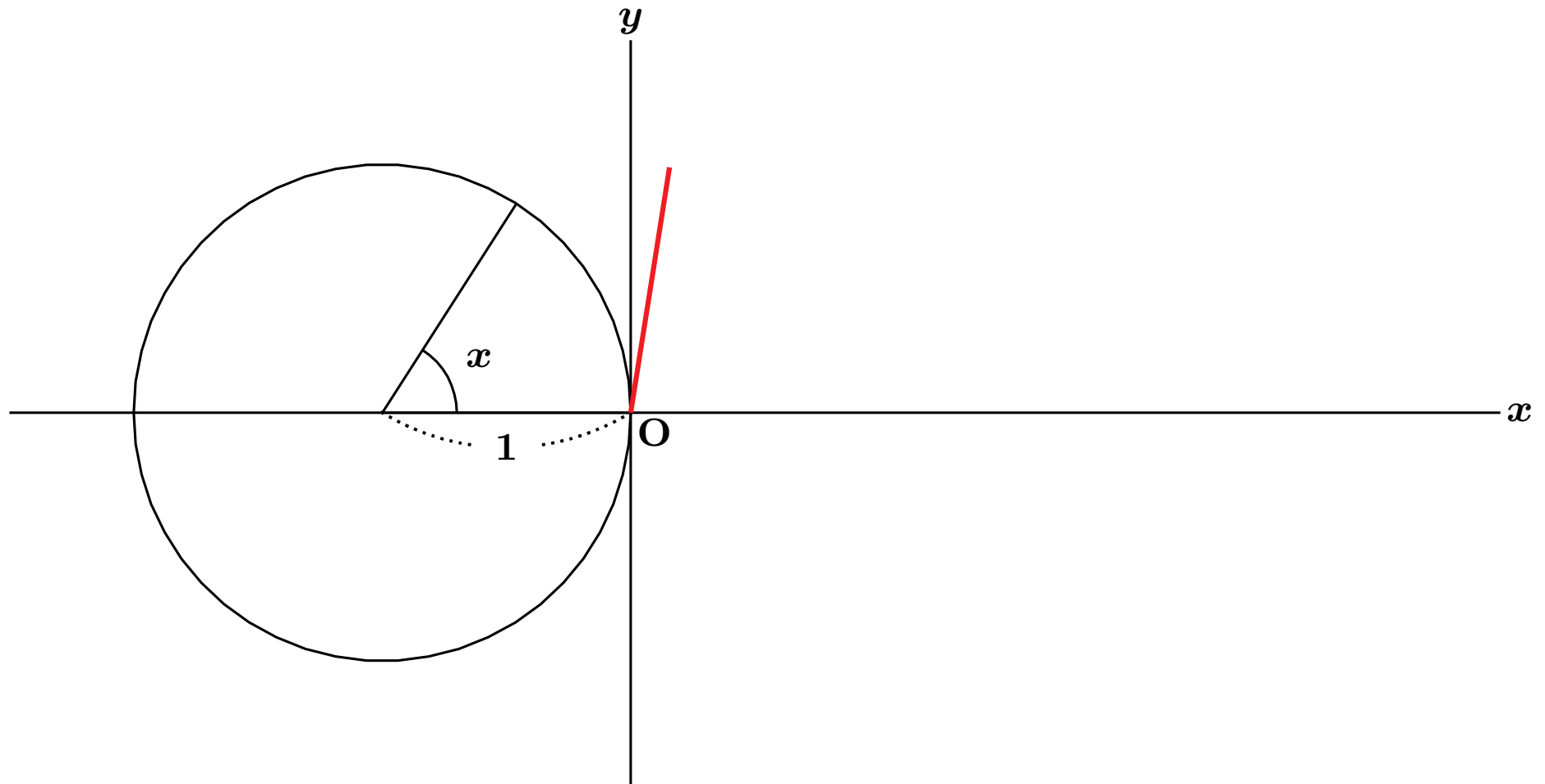
# $y = \sin x$ のグラフのかき方



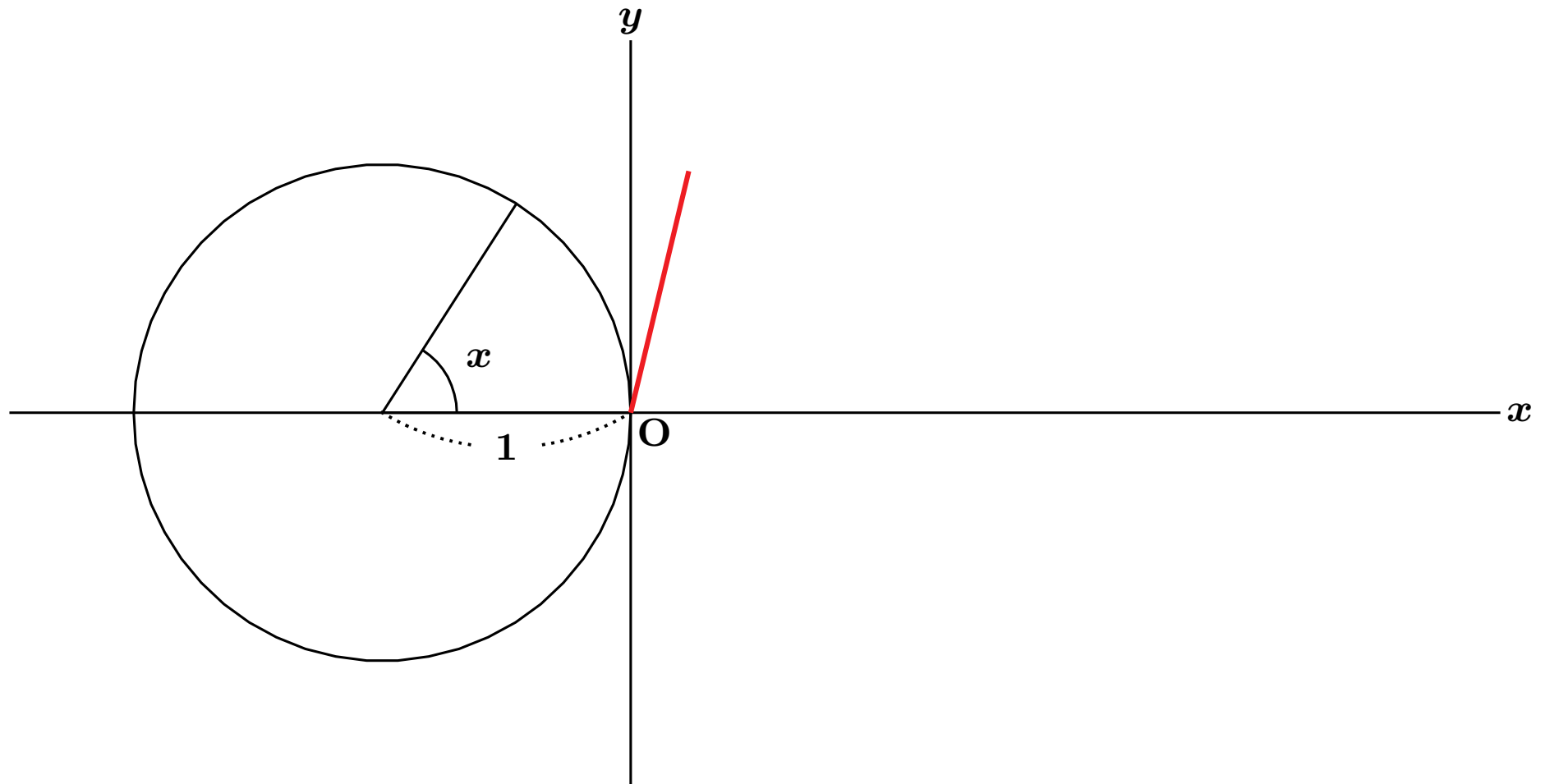
# $y = \sin x$ のグラフのかき方



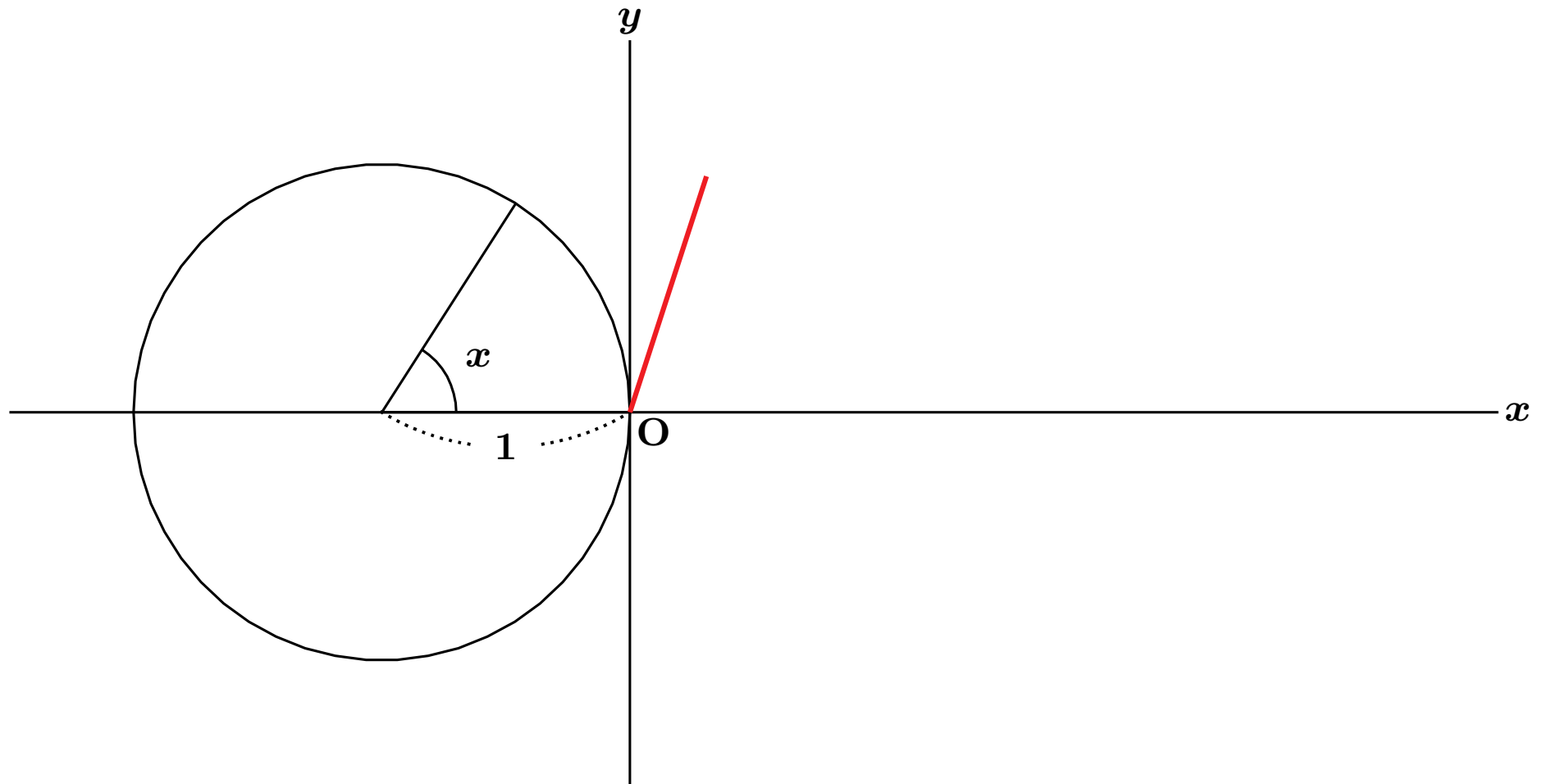
# $y = \sin x$ のグラフのかき方



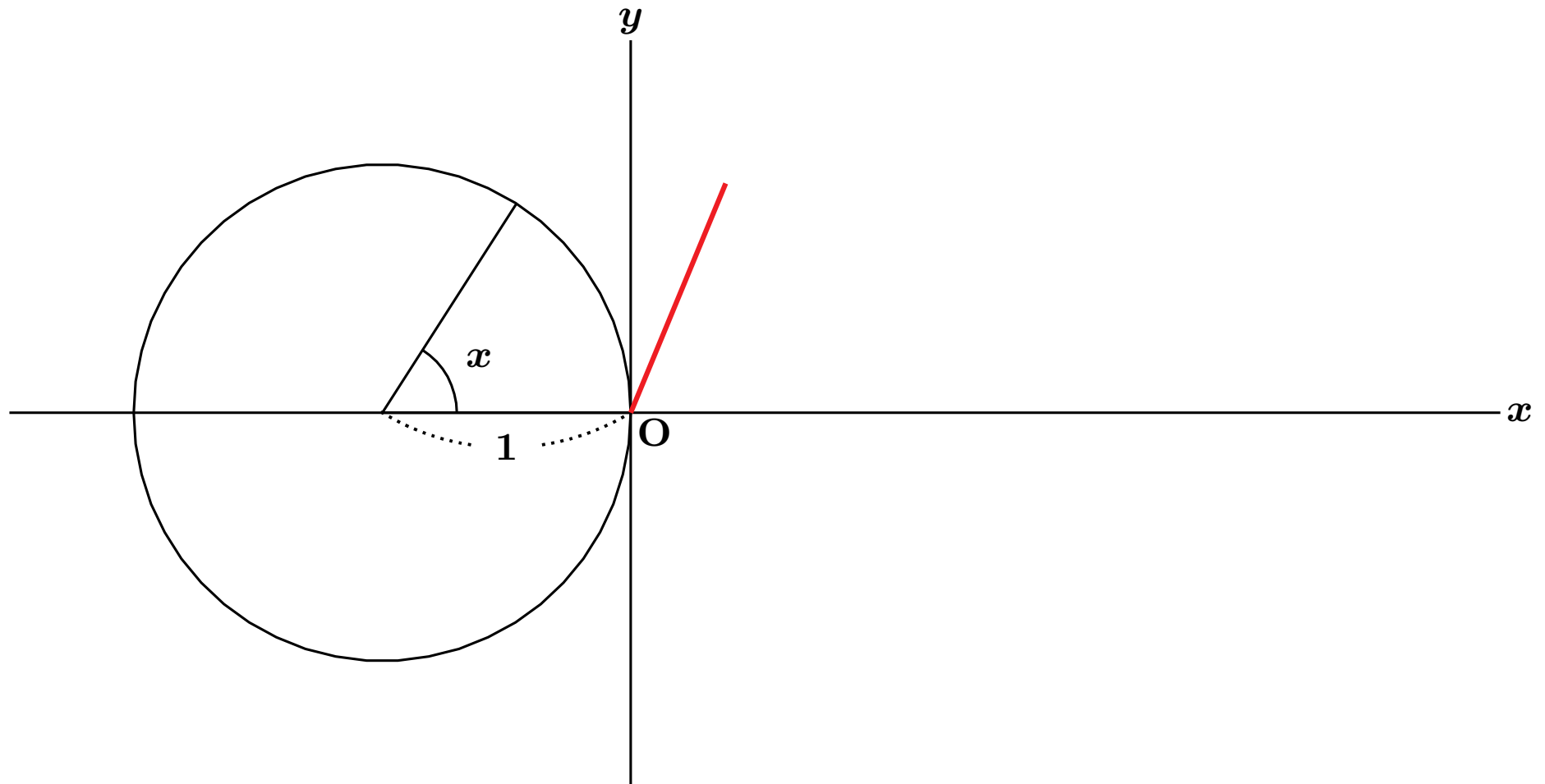
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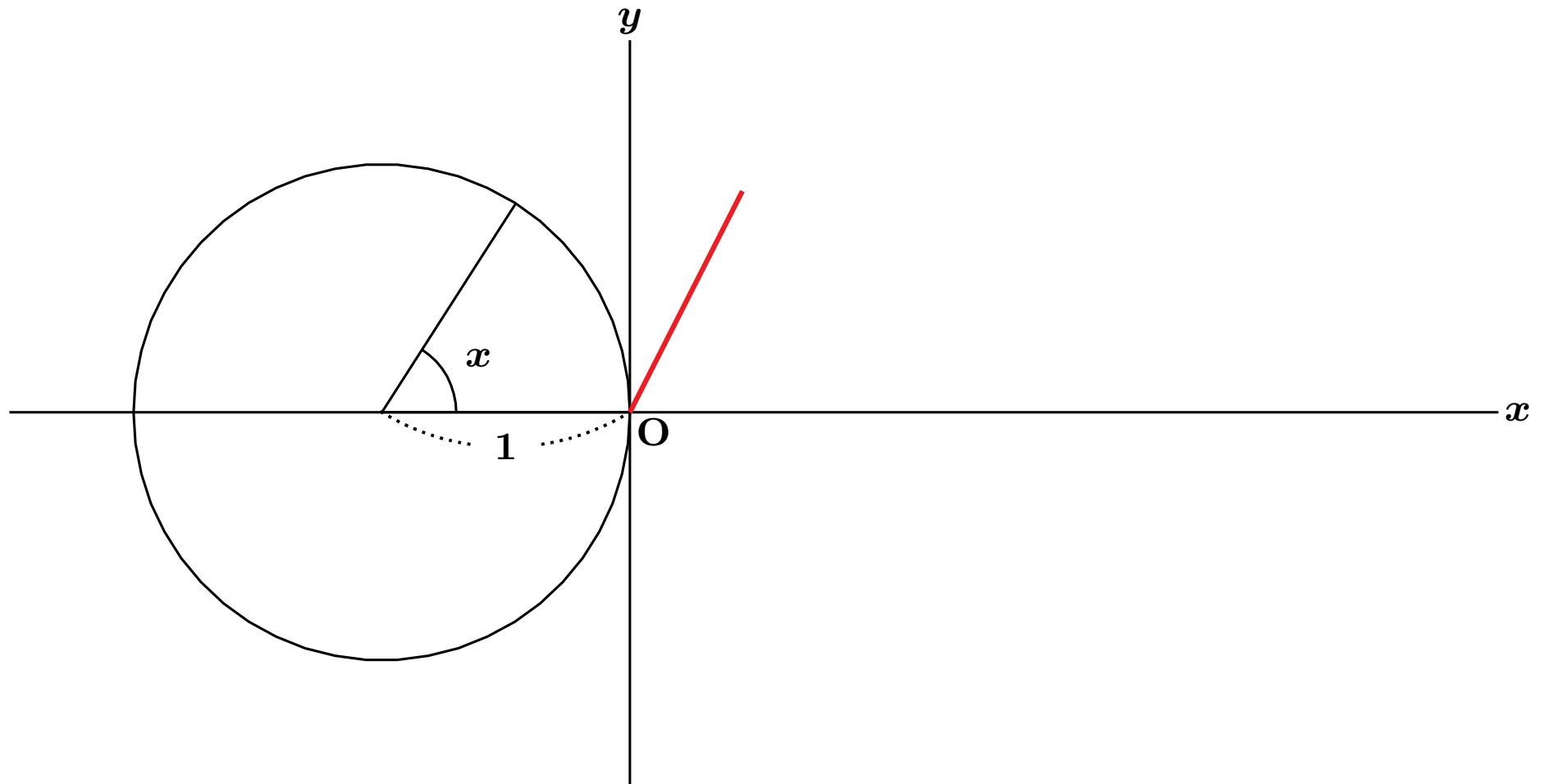
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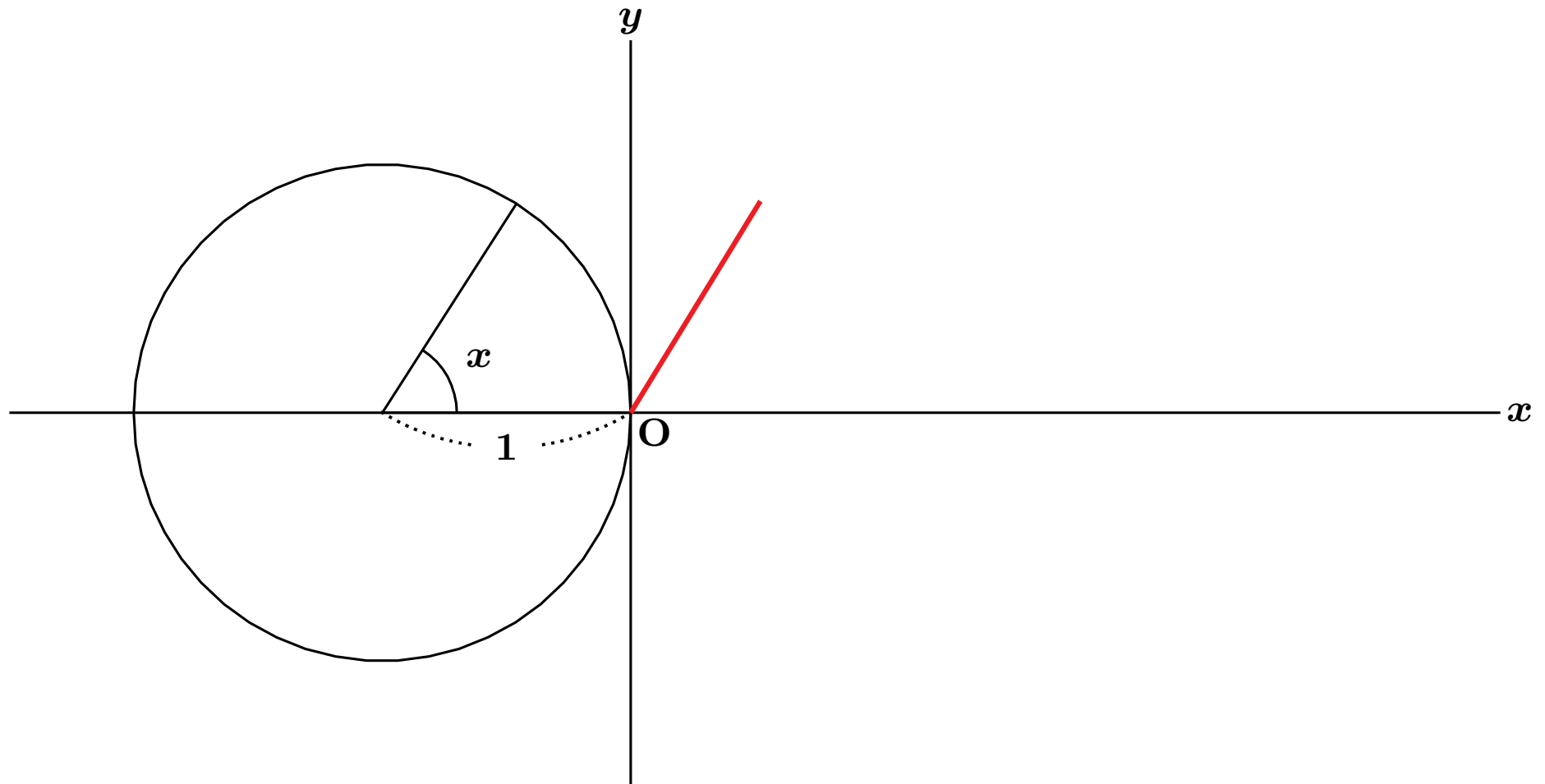


# $y = \sin x$ のグラフのかき方

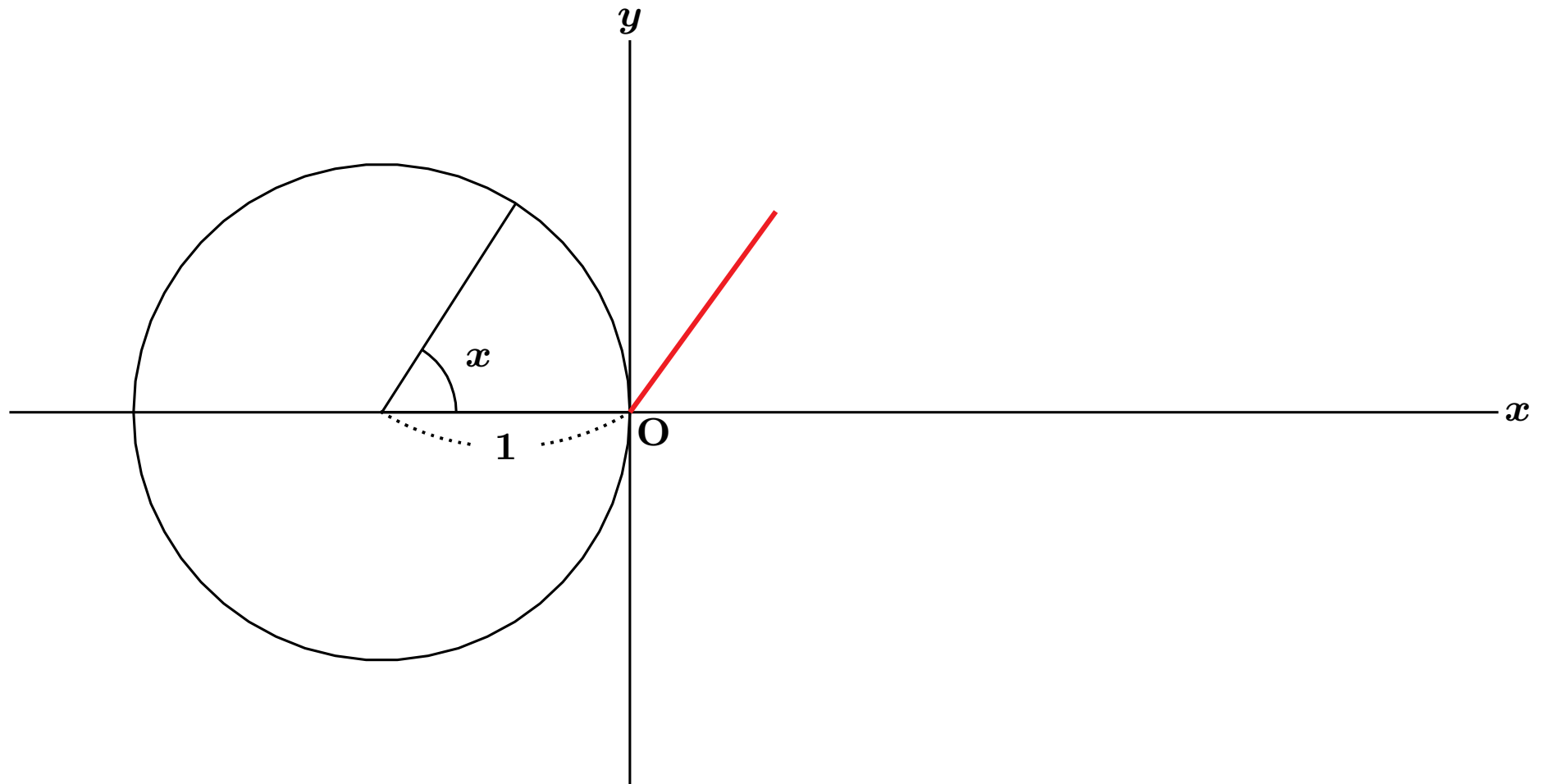




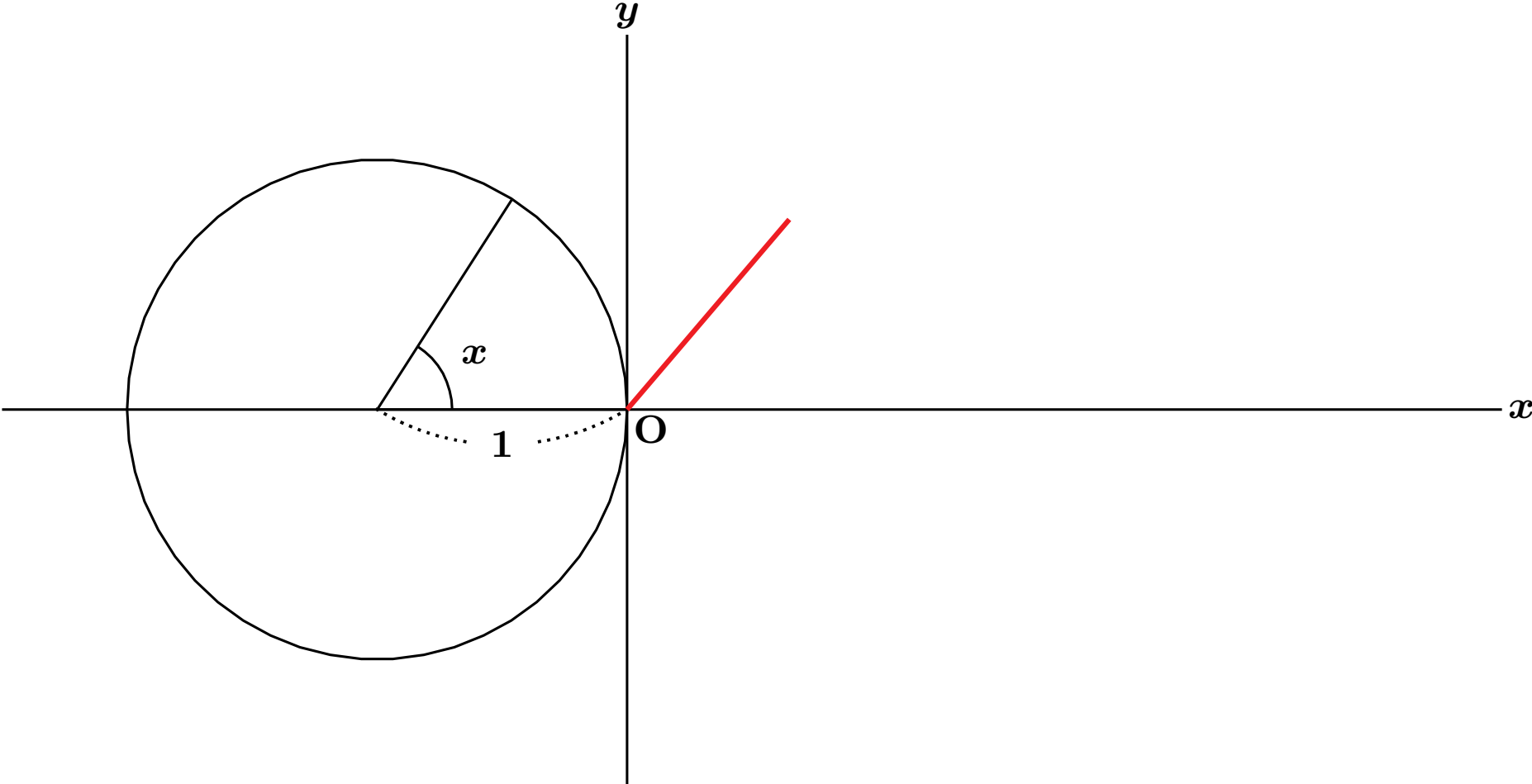
# $y = \sin x$ のグラフのかき方



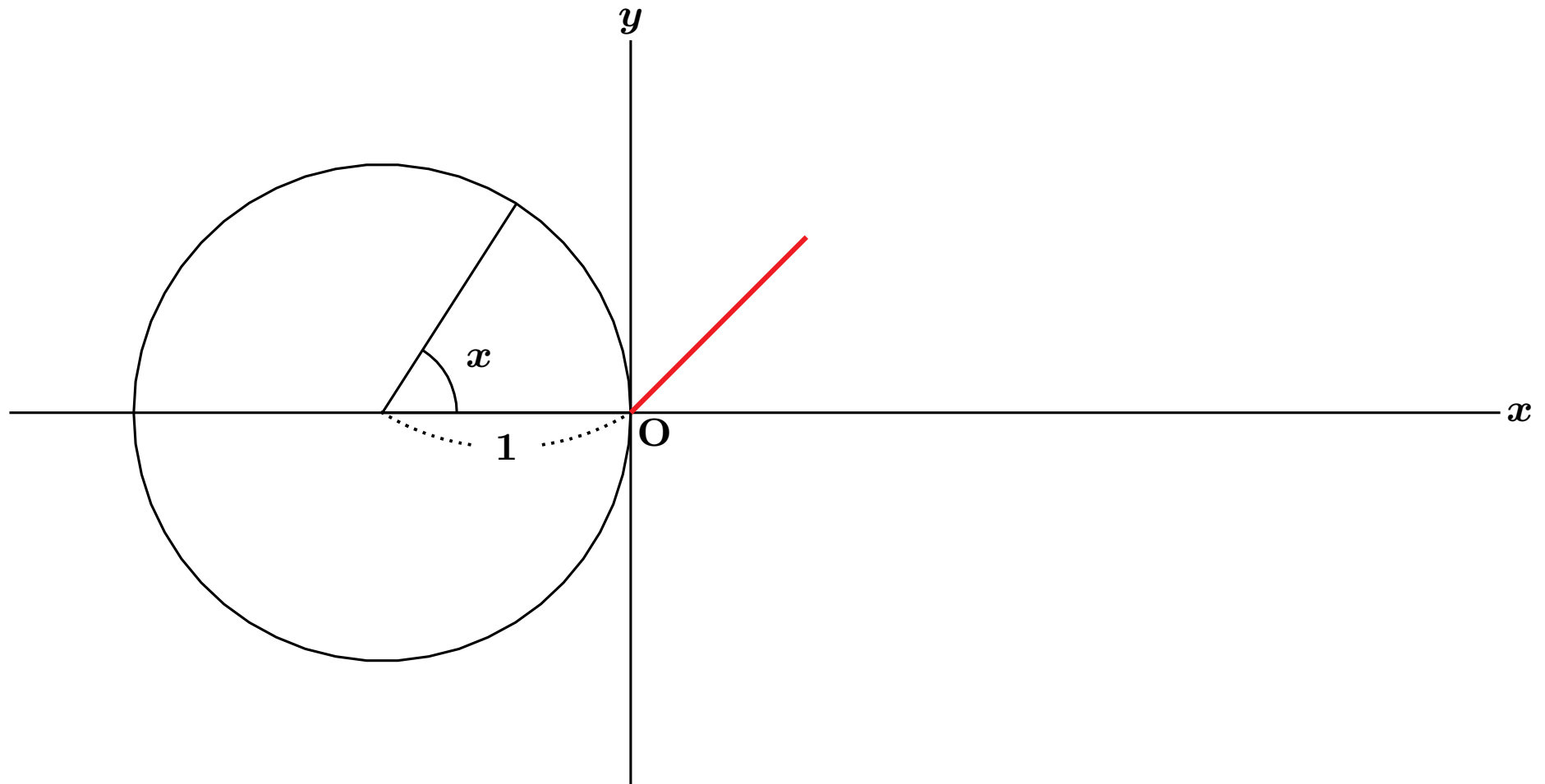
# $y = \sin x$ のグラフのかき方



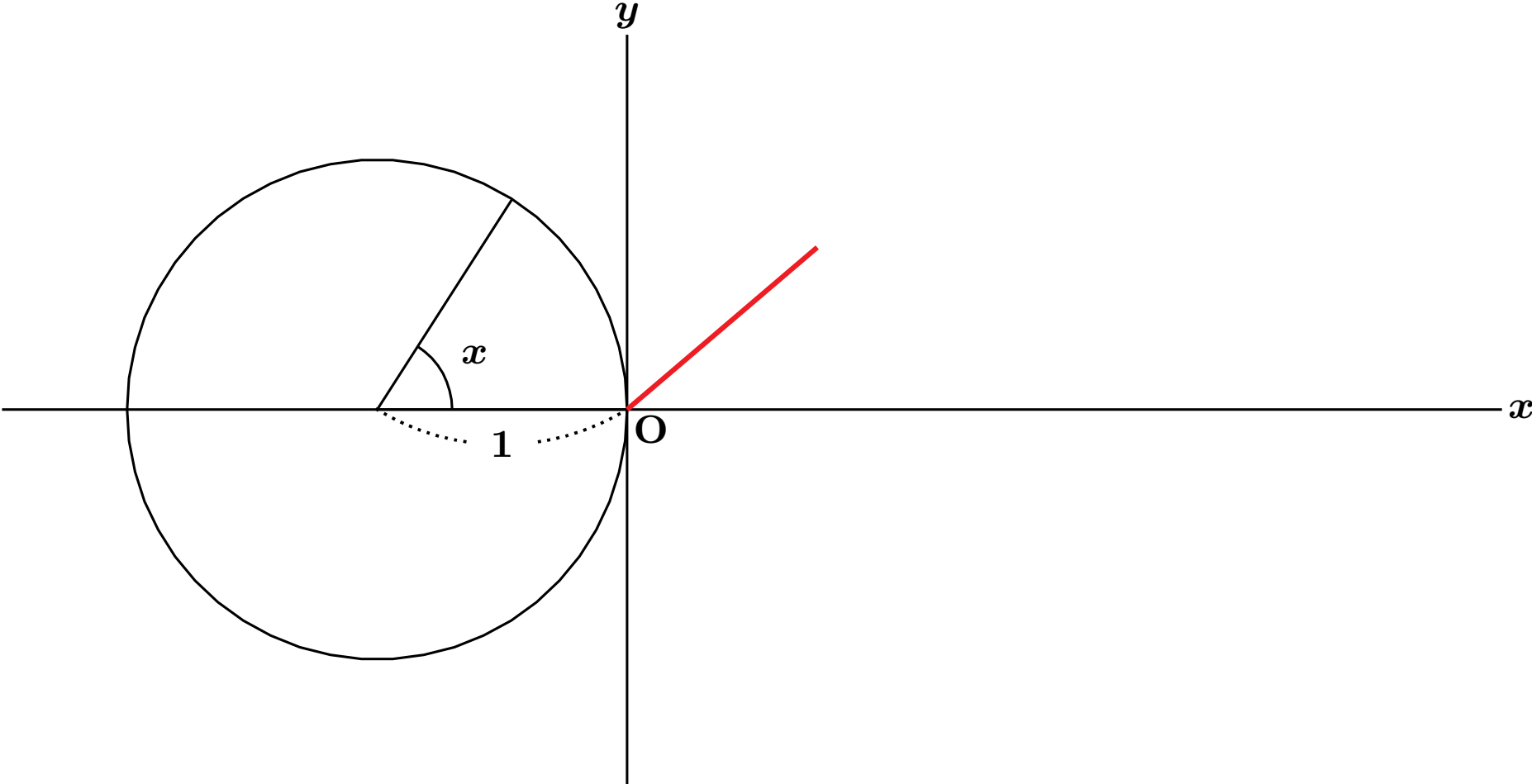
# $y = \sin x$ のグラフのかき方



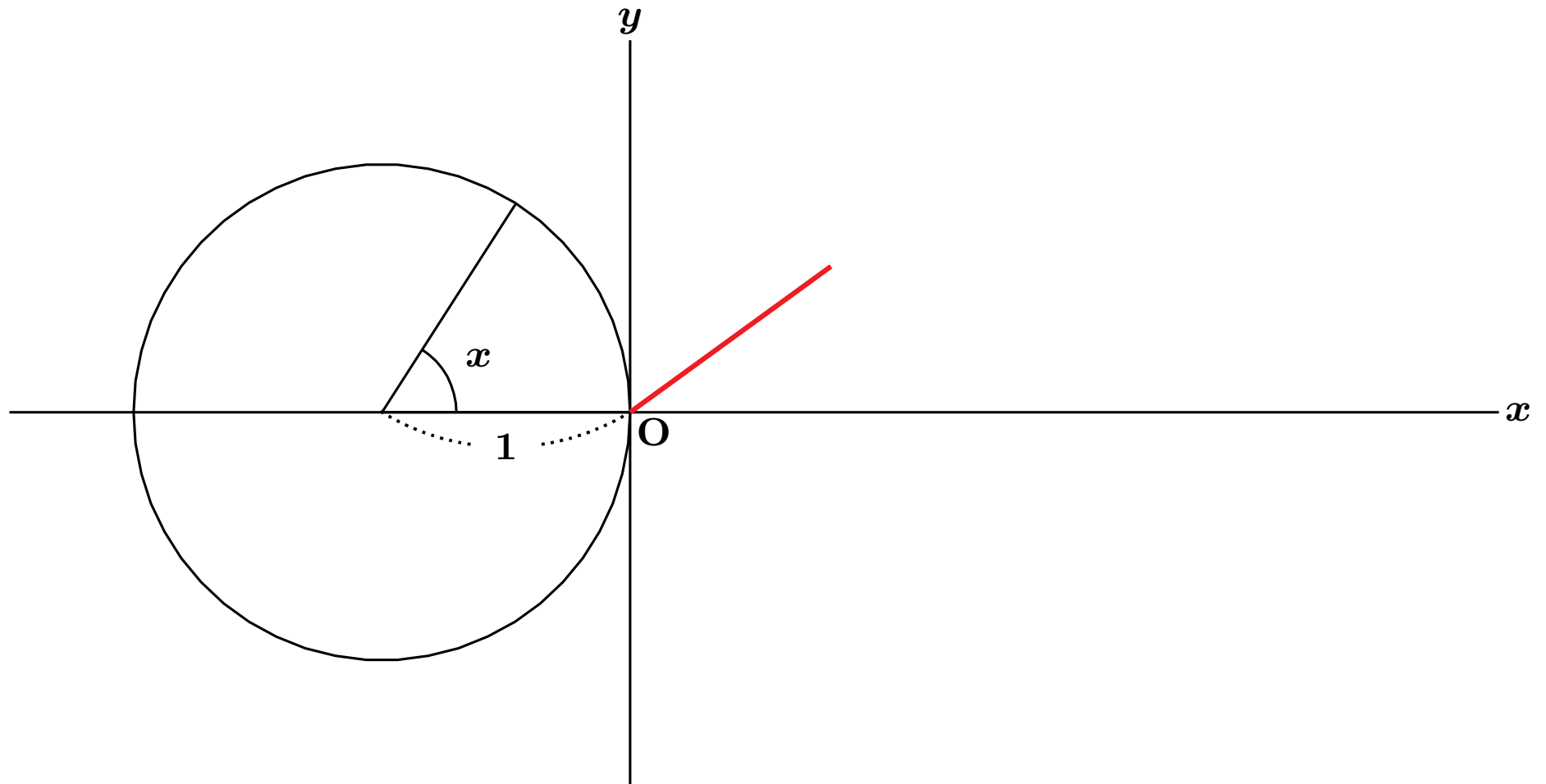
# $y = \sin x$ のグラフのかき方



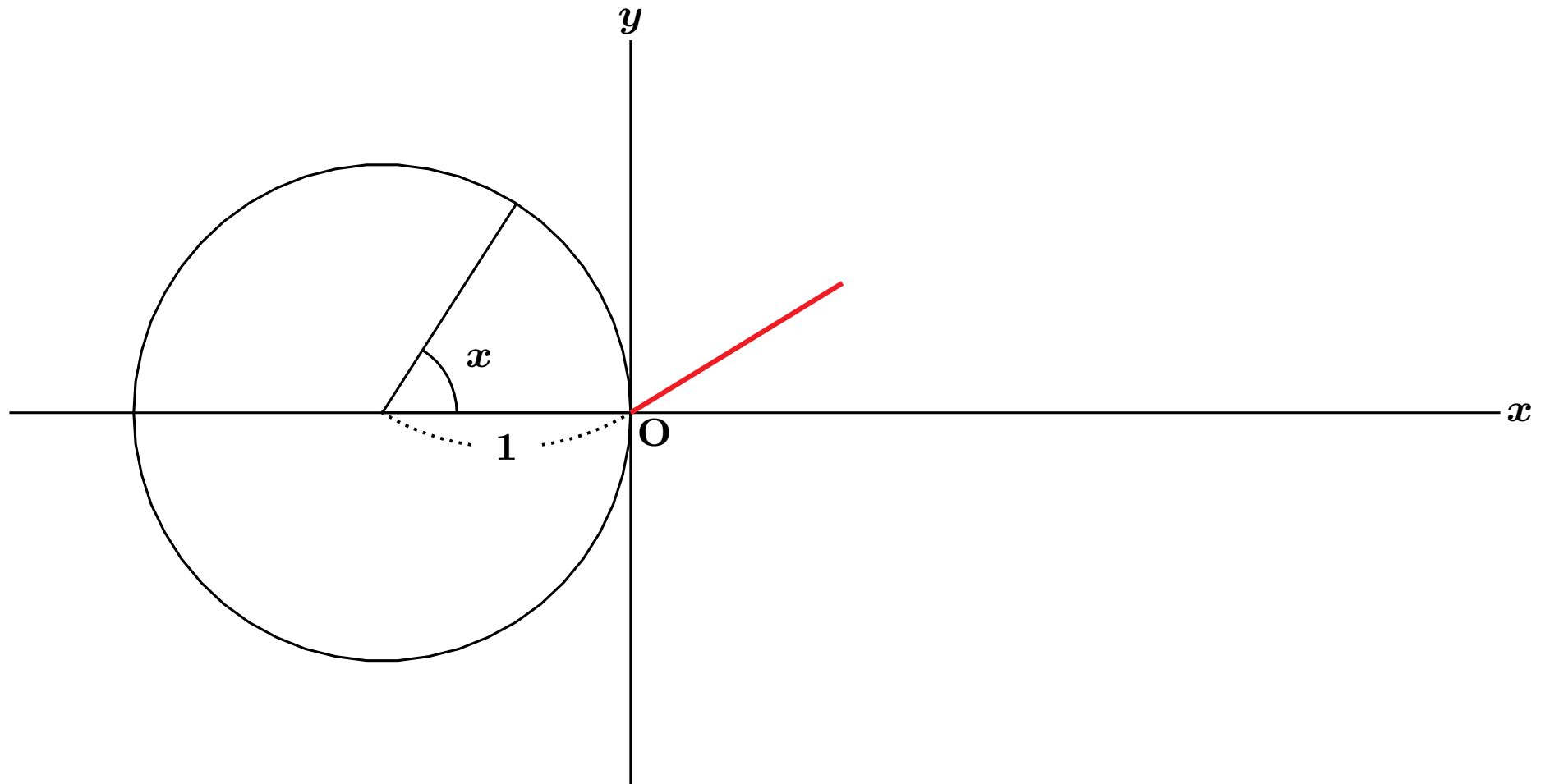
# $y = \sin x$ のグラフのかき方



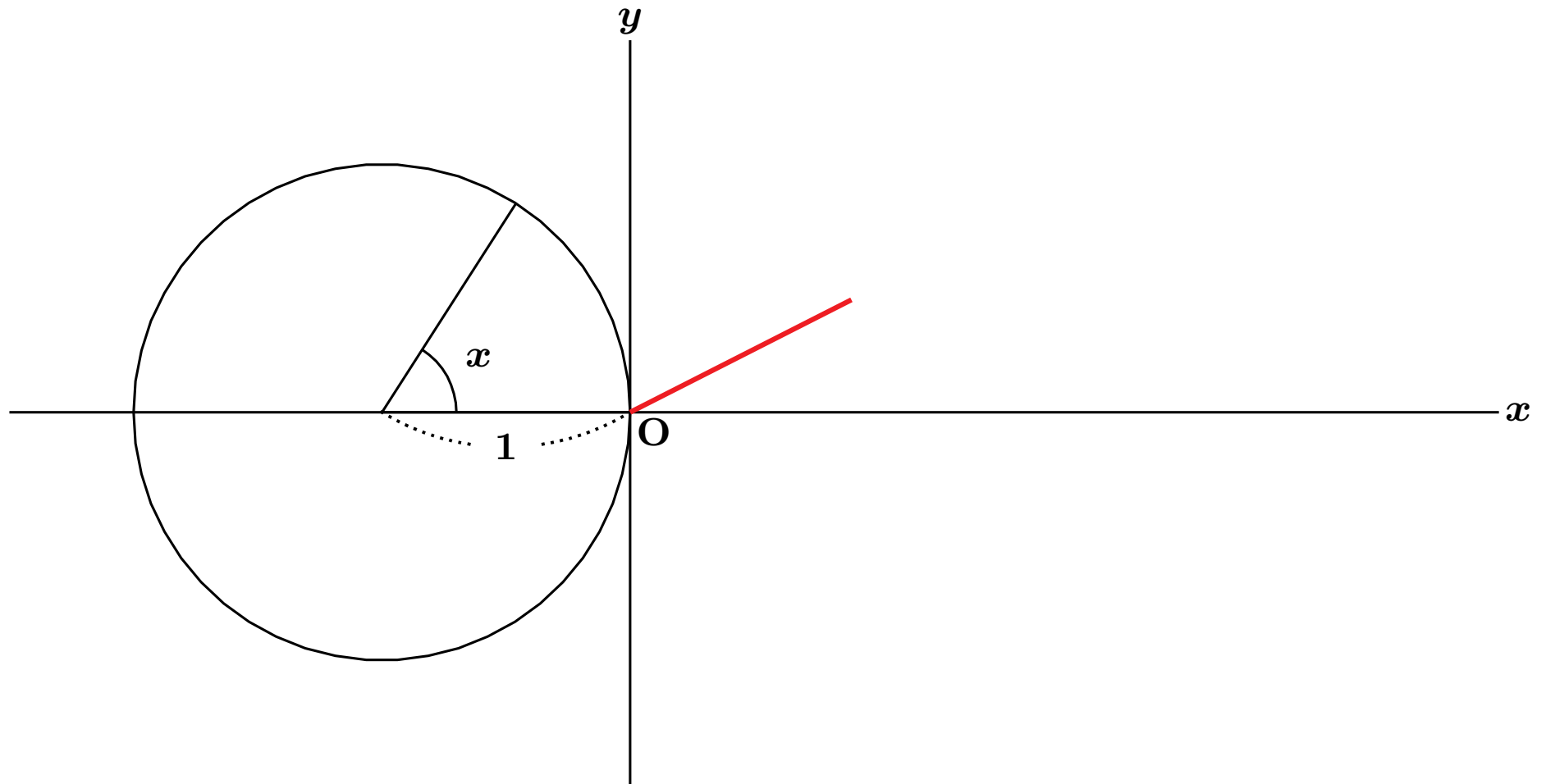
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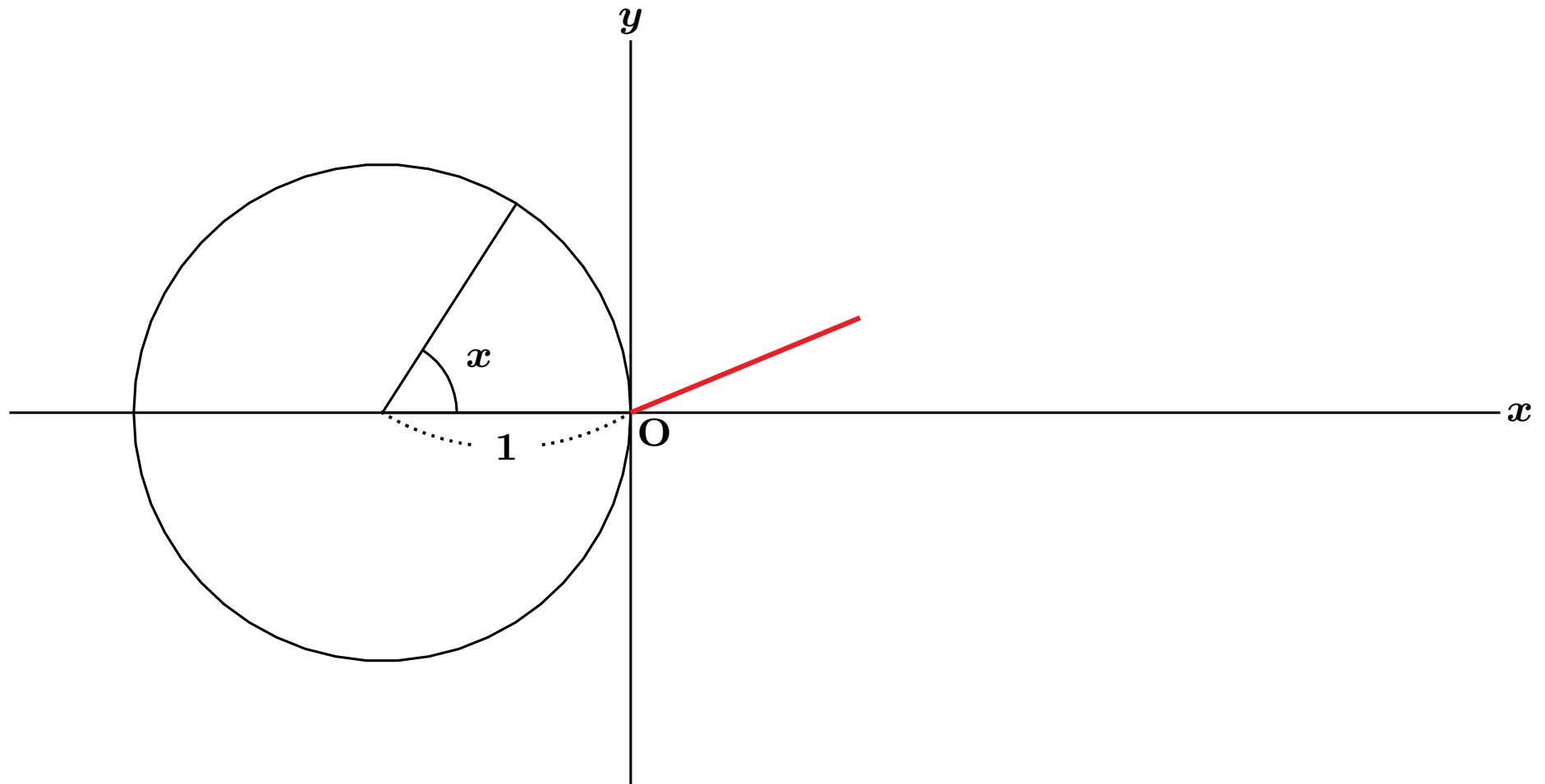


# $y = \sin x$ のグラフのかき方

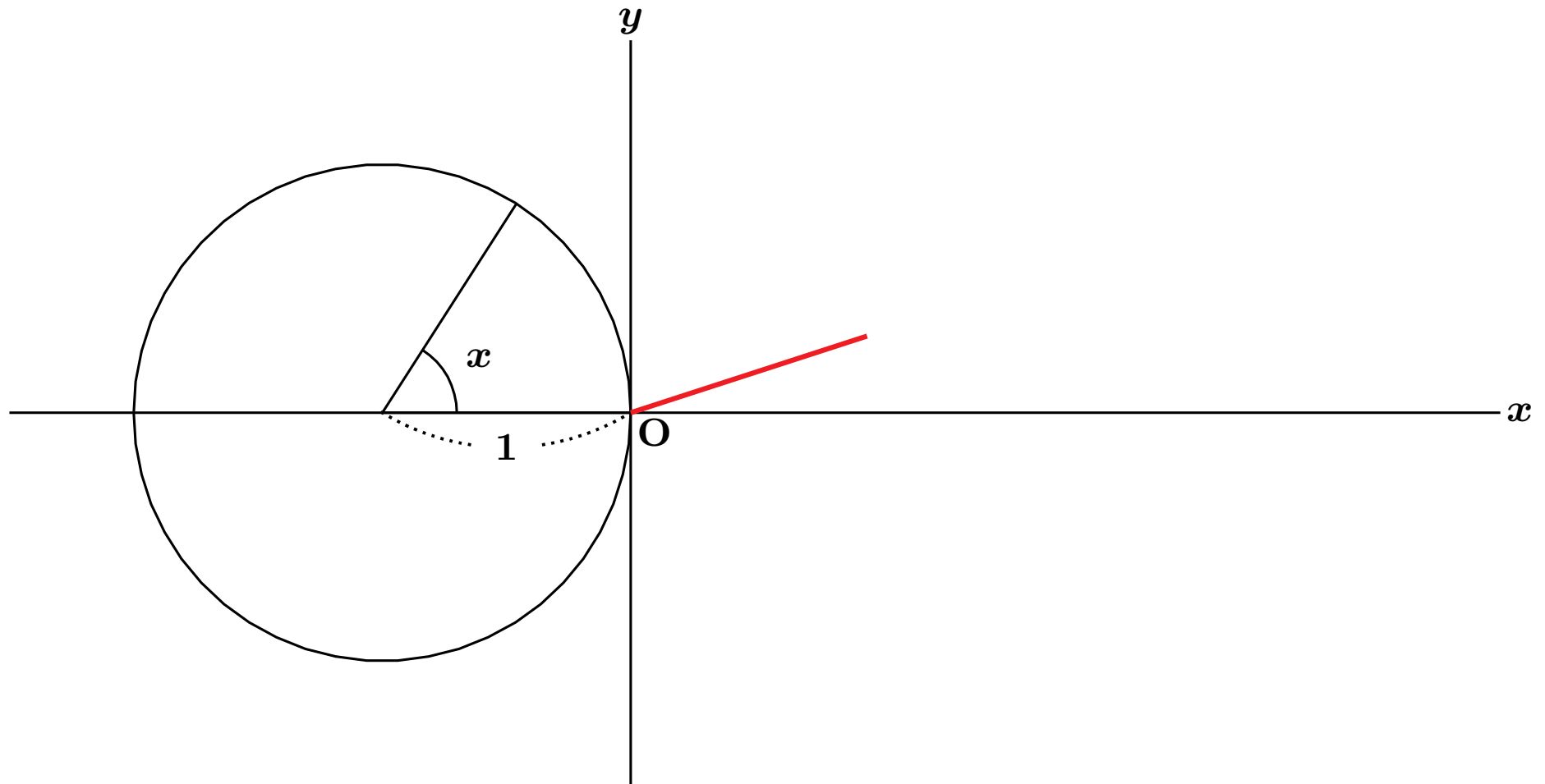




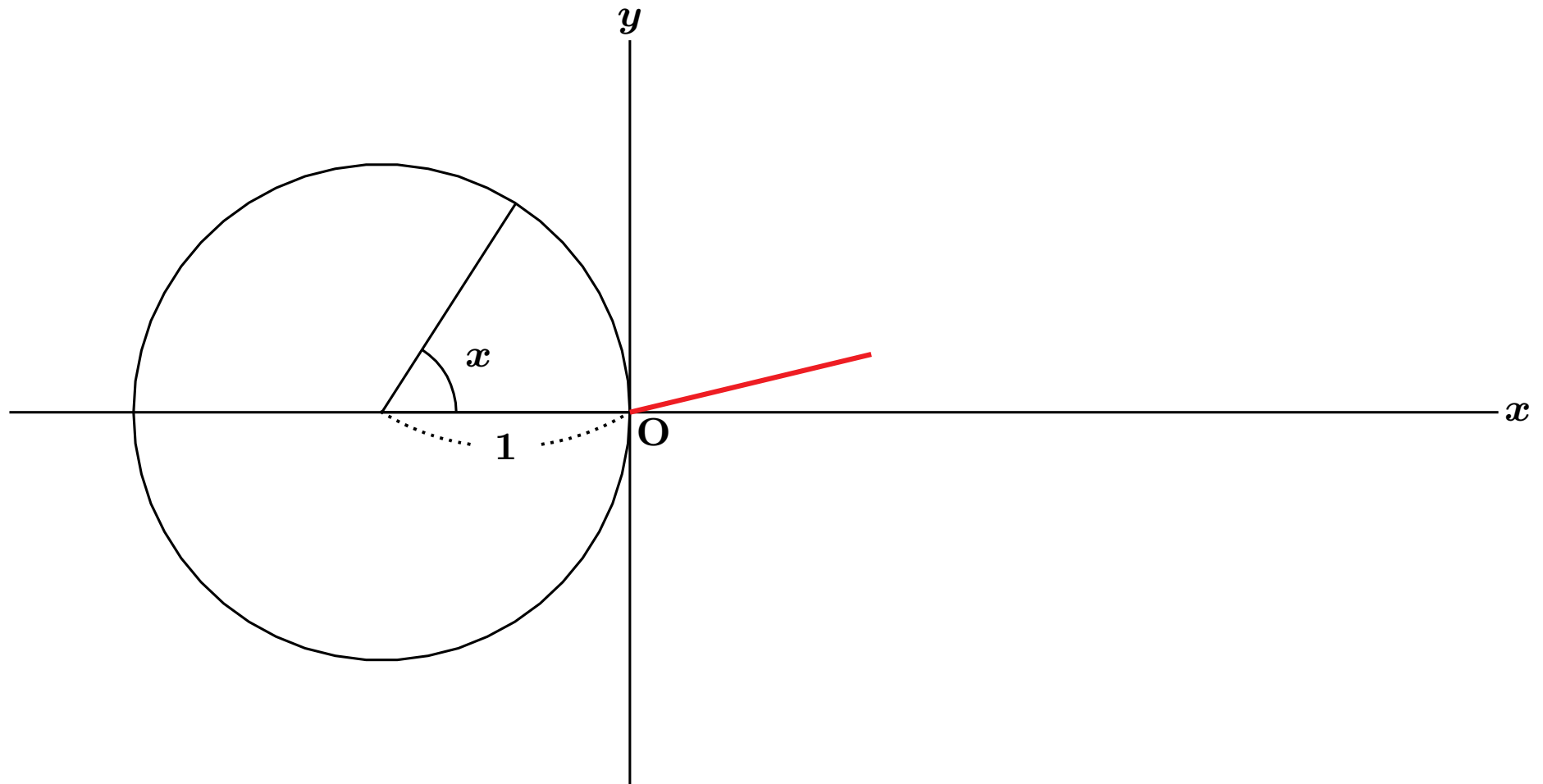
# $y = \sin x$ のグラフのかき方



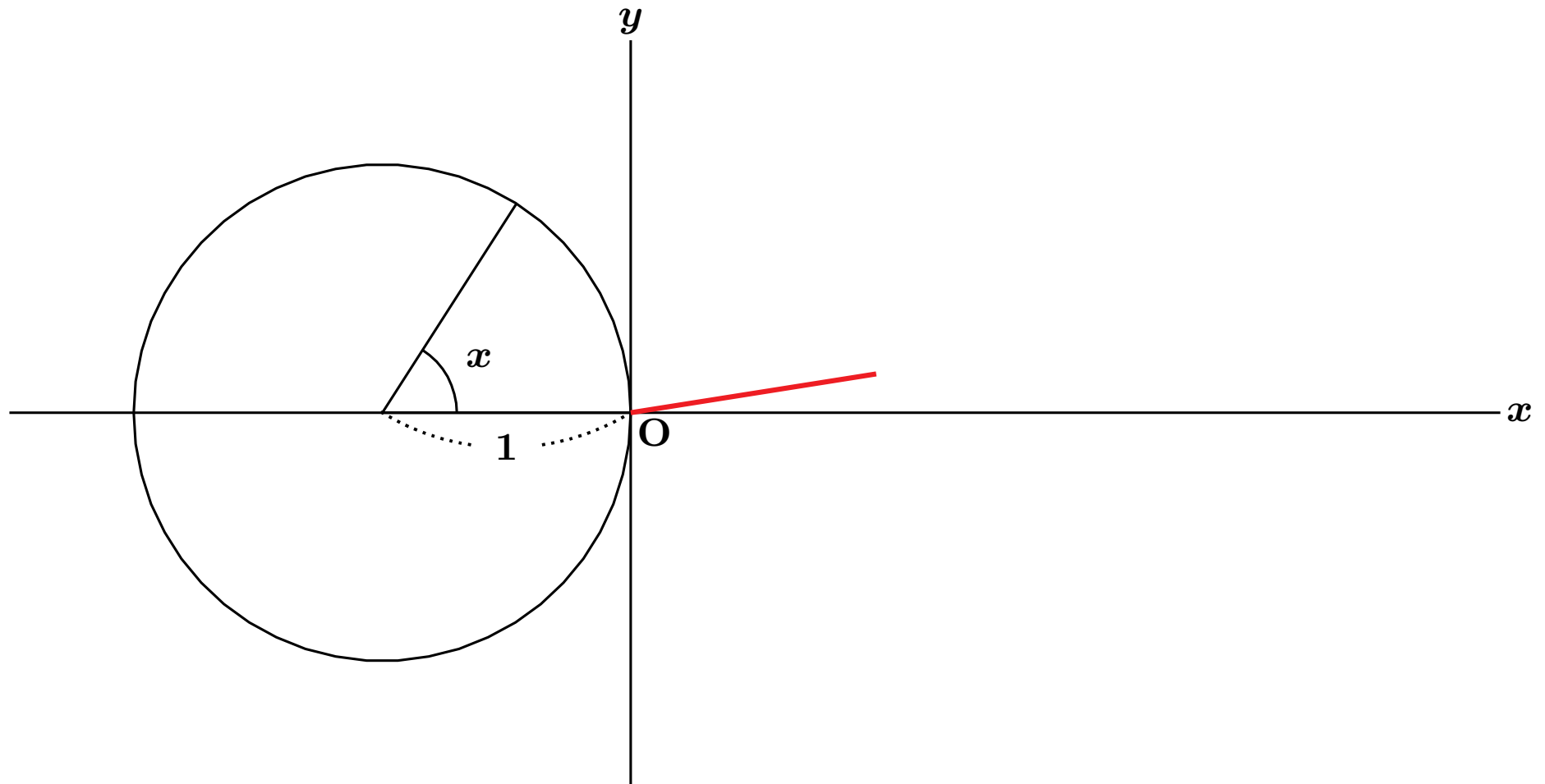
# $y = \sin x$ のグラフのかき方



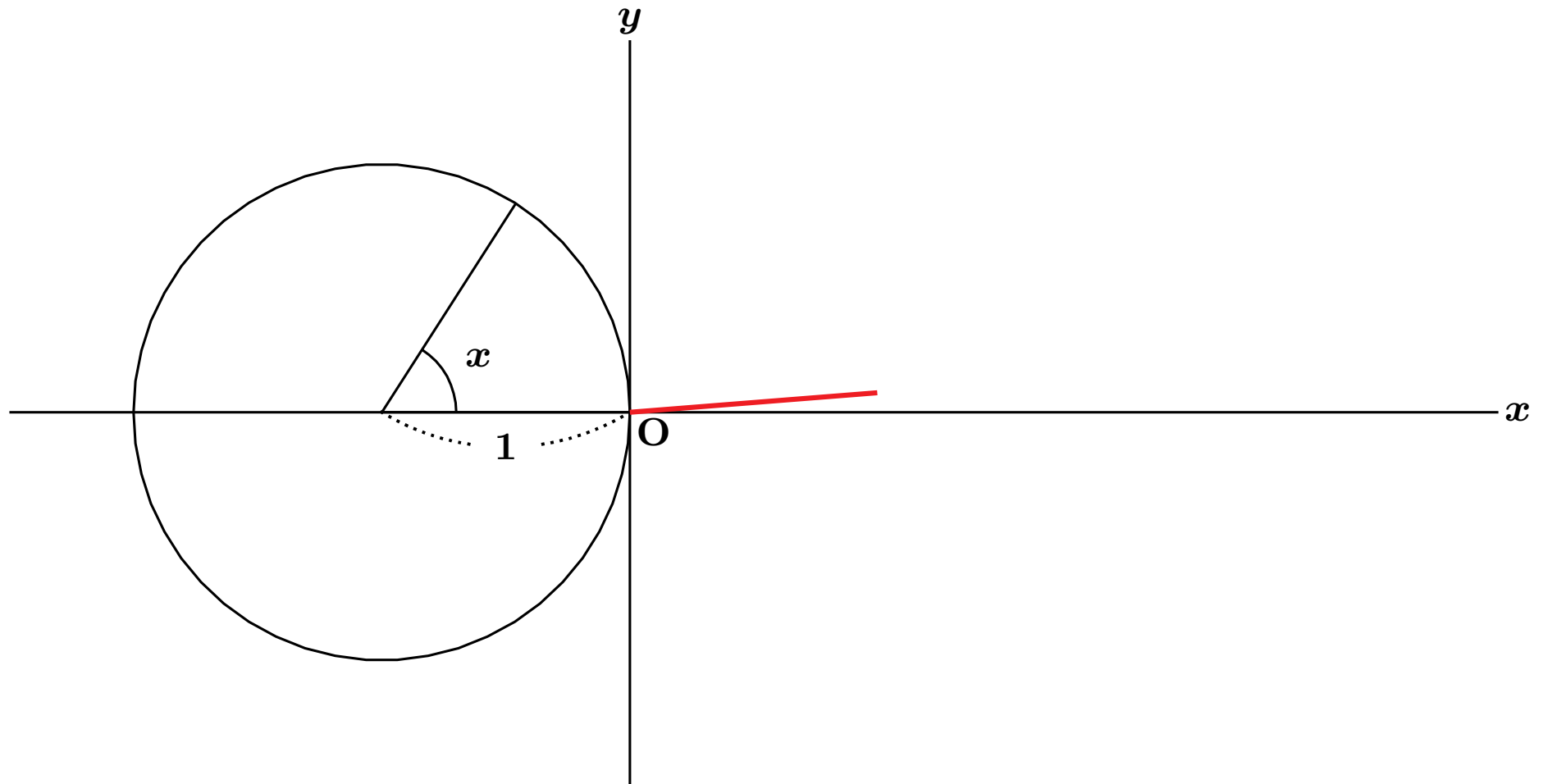
# $y = \sin x$ のグラフのかき方



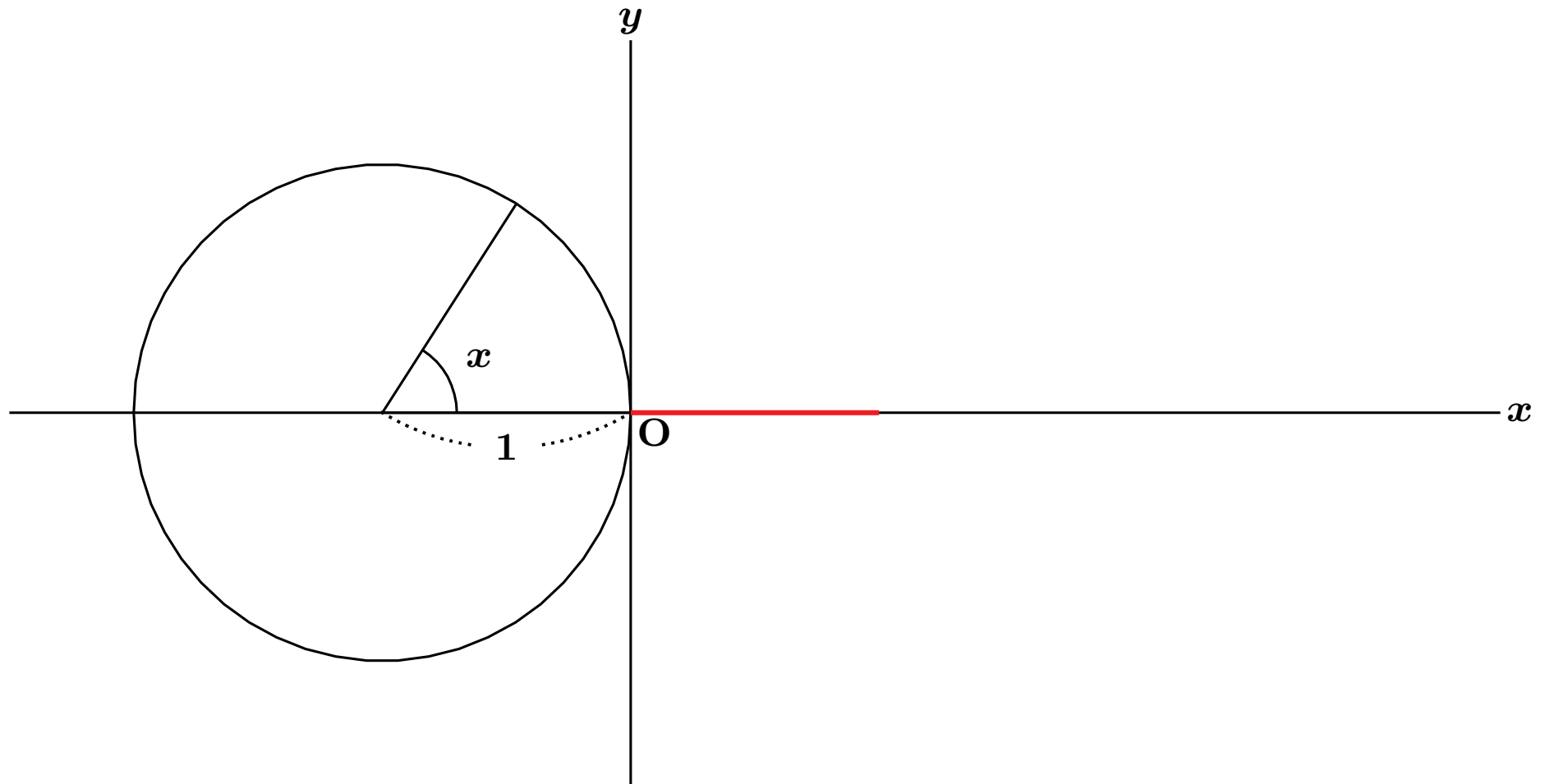
# $y = \sin x$ のグラフのかき方



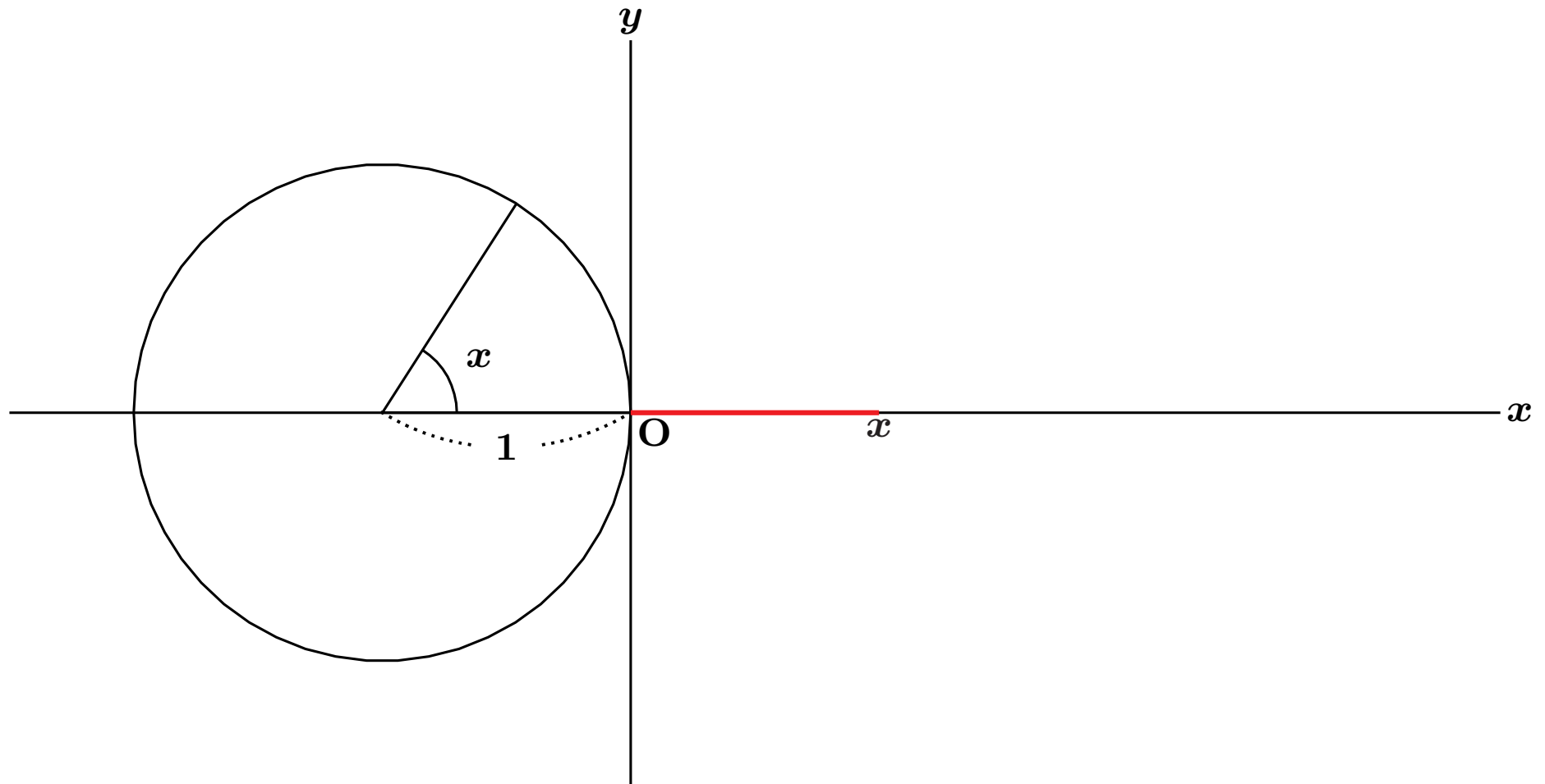
# $y = \sin x$ のグラフのかき方



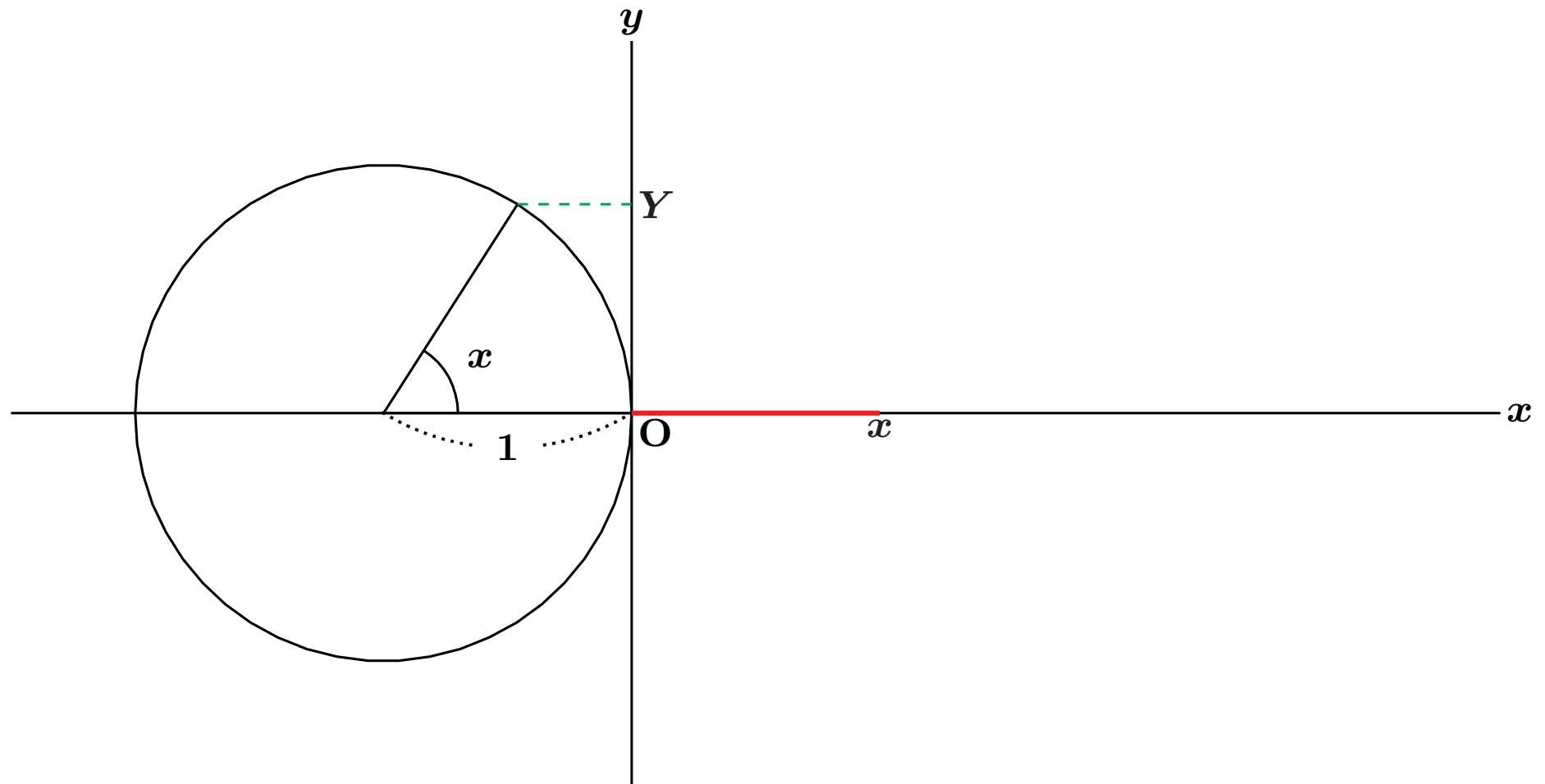
# $y = \sin x$ のグラフのかき方



# $y = \sin x$ のグラフのかき方

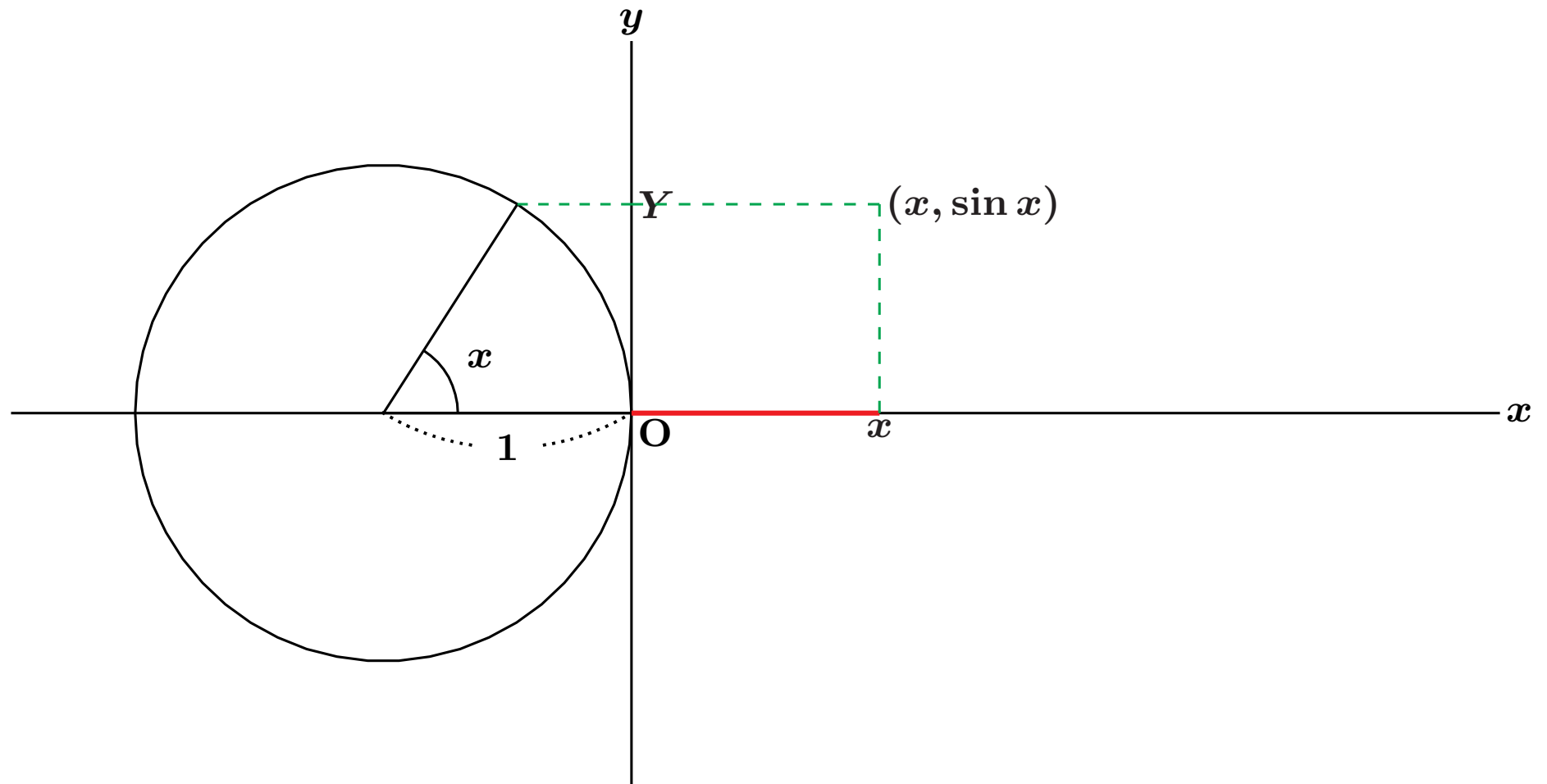


# $y = \sin x$ のグラフのかき方





# $y = \sin x$ のグラフのかき方



# $y = \sin x$ のグラフ (KeTCindyJS)

- s21sine3

## 楕円の焦点

- スクリプト (一部)

```
cmdL=[
  . . . . .
  "eq3:ev(f=0,[x=x1+u2*t,y=y1+v2*t])",[],
  "ans:solve(eq3,t)",[],
  "u2::v2::tb::x2b::y2b::ta::x2a::y2a",[]
];
Calcbym("ans",cmdL,[""]);
Ketcindyjsdata(["ans0",ans0,"ans",ans]);//no ketjs off
```

- s0612ellipticalbilliard

# Hypotrochoid

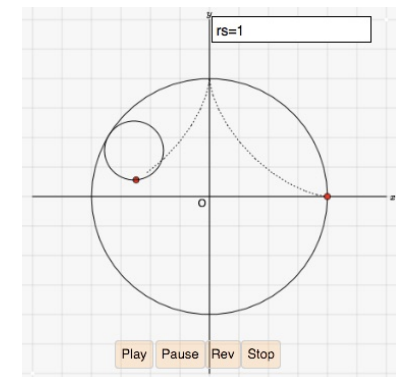
## ● スクリプト (一部)

```

Move(pdata,t):=(
    ....
    qt=Rotatepoint(pt,-rad*t/rs,pB);
    tmp=(rad-rs)*[cos(t),sin(t)];
    qt=Translatepoint(qt,tmp-pB);
    qt=Rotatepoint(qt,t,tmp);
    ....
);

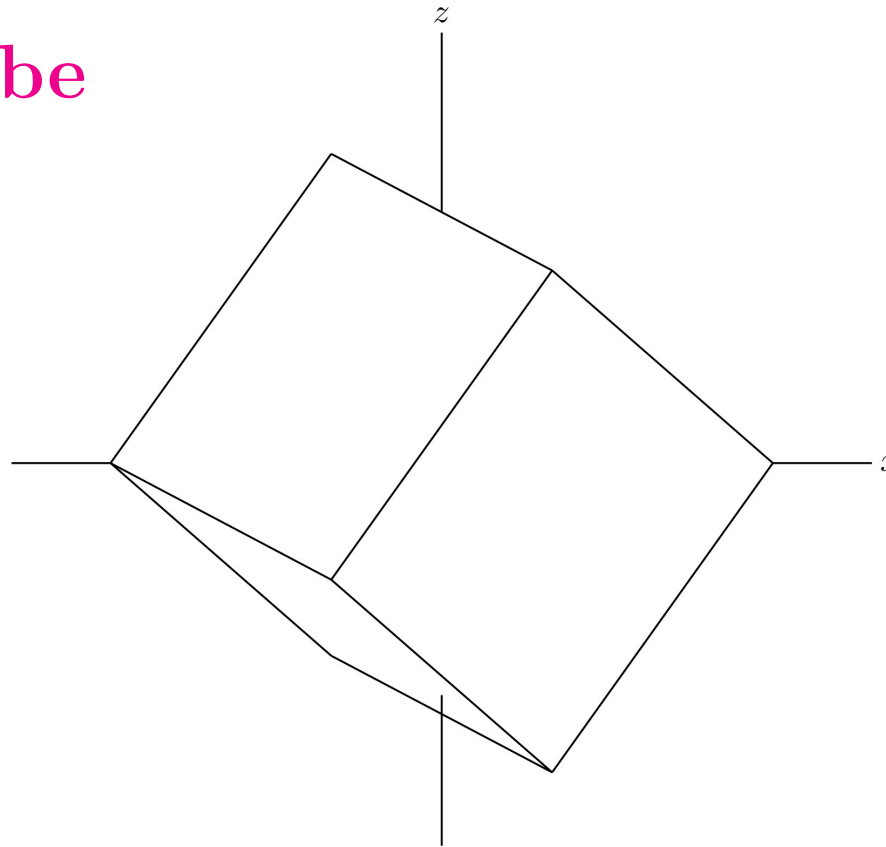
```

## ● s0607hypotrochoid



# 立方体の回転

- s21rotatecube

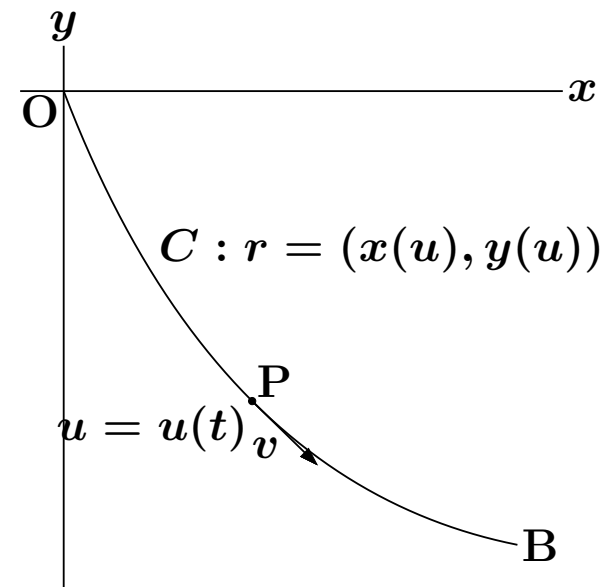


## 最速降下曲線

- $\frac{du}{dt} = \sqrt{\frac{-2gy}{\dot{x}^2 + \dot{y}^2}}, \quad u(0) = 0$

- $T = \int_0^U \sqrt{\frac{\dot{x}^2 + \dot{y}^2}{-2gy}} du$

- s1611brachistchrone



# Swinging Atwood's machine

●  $\mathcal{L} =$

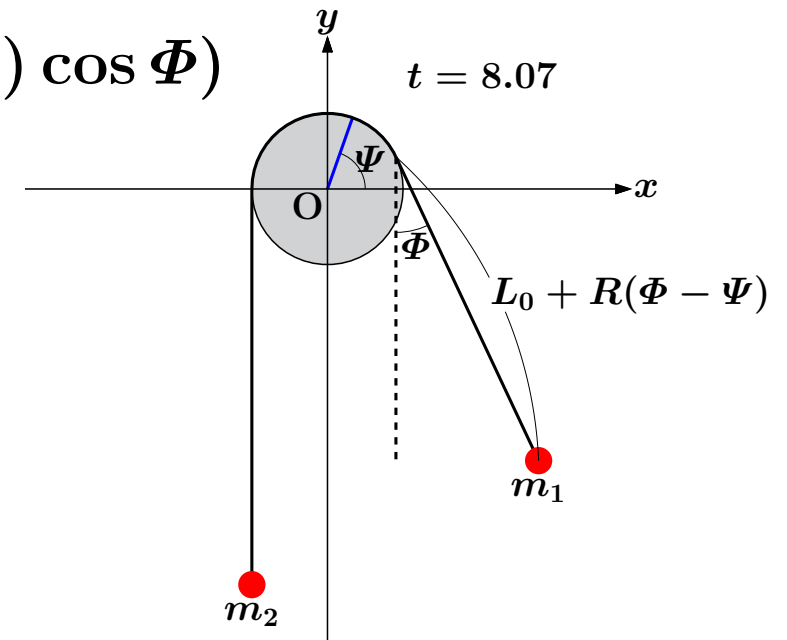
$$\frac{1}{2}m_1(L_0 + R(\Phi - \Psi))^2\dot{\Phi}^2$$

$$+ \frac{1}{2}(I_0 + (m_1 + m_2)R^2)\dot{\Psi}^2$$

$$- m_1g(R\sin\Phi - (L_0 + R(\Phi - \Psi))\cos\Phi)$$

$$+ m_2gR\Psi$$

● s1614atwood



## まとめと課題

- K<sub>E</sub>TCindyJS は種々のインタラクティブな教材を作成できる可能性をもつ
- 結果として，教員と学生のコミュニケーションを推進するだろう
- 現在の所，CAS や C を直接呼び出せない．
- ketcindyjs のファイルをモジュール化することで可能？  
(北本さんの javacript パッケージを利用)