KeTCindyJSの開発と教育利用

高遠節夫

東邦大学

2019.08.21 RIMS

今日の資料（QR コード）

KETpic,KETCindy,KETCindyJS

- KETpic は TEX 描画ペッケージのプリプロセッサ

  Tpic, pict2e, TikZ

- KETCindy = KETpic + Cinderella2

- KETCindyJS = KETCindy + CindyJS

KETCindy のインストール

- CTAN(Comprehensive TEX Archive Network) が KETCindy をアップロードした（2018）

  ctan 「ctan>ketcindy」で検索

  （TeXLive 開発者の Norbert さん，山本さん）

- KETCindy(-master) にある readme.pdf に従ってインストールすればよい

- KeTCindyReference(E,J) や iBook もある

  （入谷さん）

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 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!

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

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

- いろいろな例がアップされている

KETCindyJS の開発

- Cinderella2 は CindyJS のスクリプトを出力できる
- CindyJS 自体は，KETCindy をサポートしていない
- Cinderella が出力する HTML に KETCindy の関数を追加できるようにした
- KETCindyJS 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, 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 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

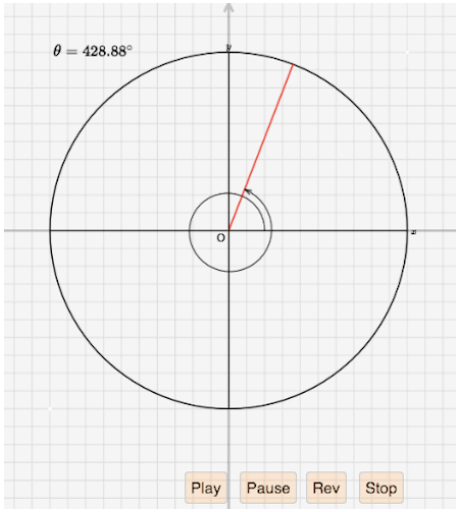
- 一般角
- 三角関数のグラフ
- 楕円の焦点
- Hypotrochoid
- 立方体の回転
- 最速降下曲線
- Atwood's machine

一般角

- スクリプト（一部）

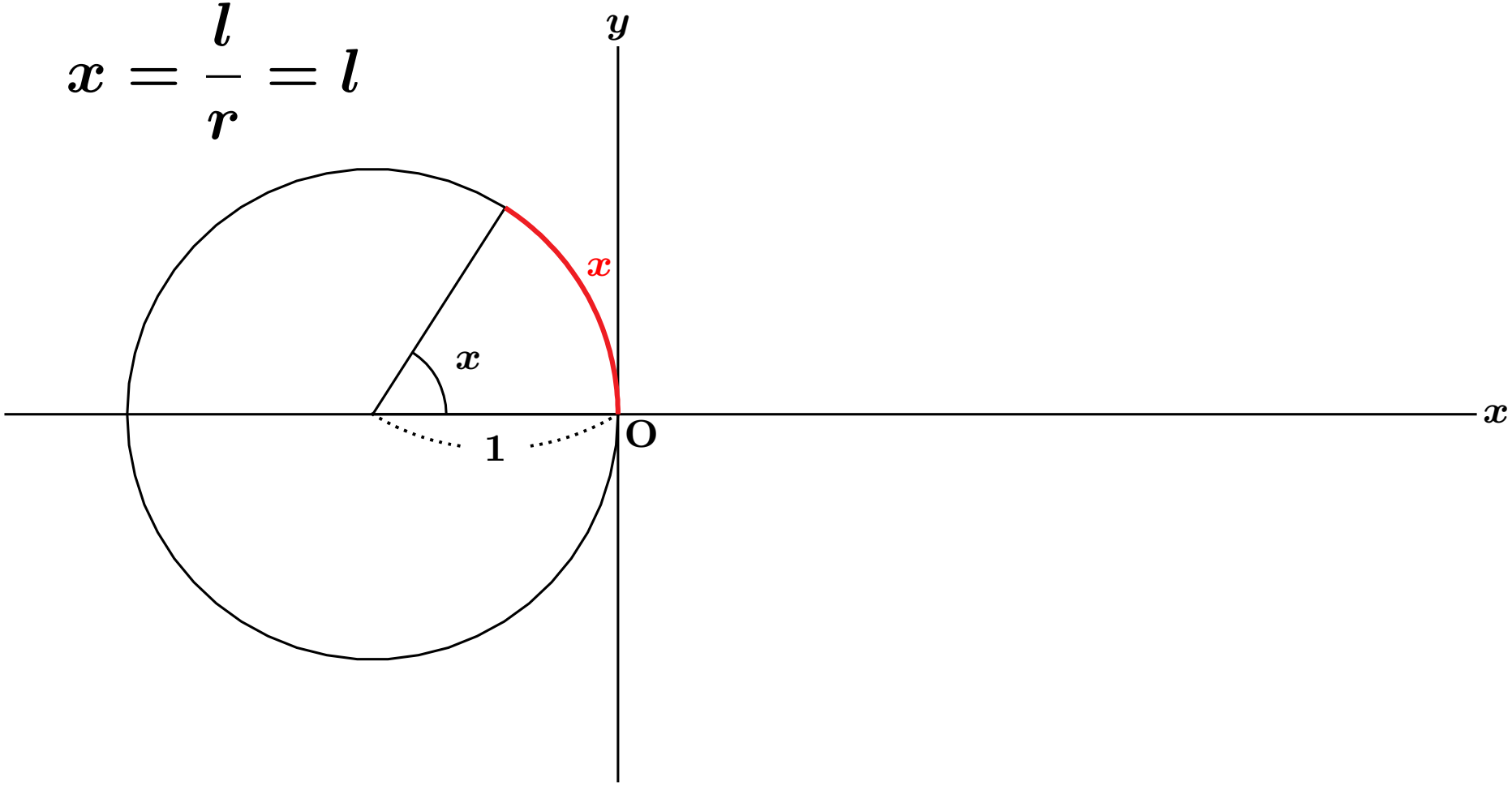
```
an=Animationparam(0,60,[-100000,100000]);
th=an*pi/180;
fun="(0.5+0.1*abs(t)/(2*pi))*[cos(t),sin(t)]";
rng=Assign("t=[0,th]",["th",th]);
Paramplot("1",fun,rng);
```

- s0611generalangle

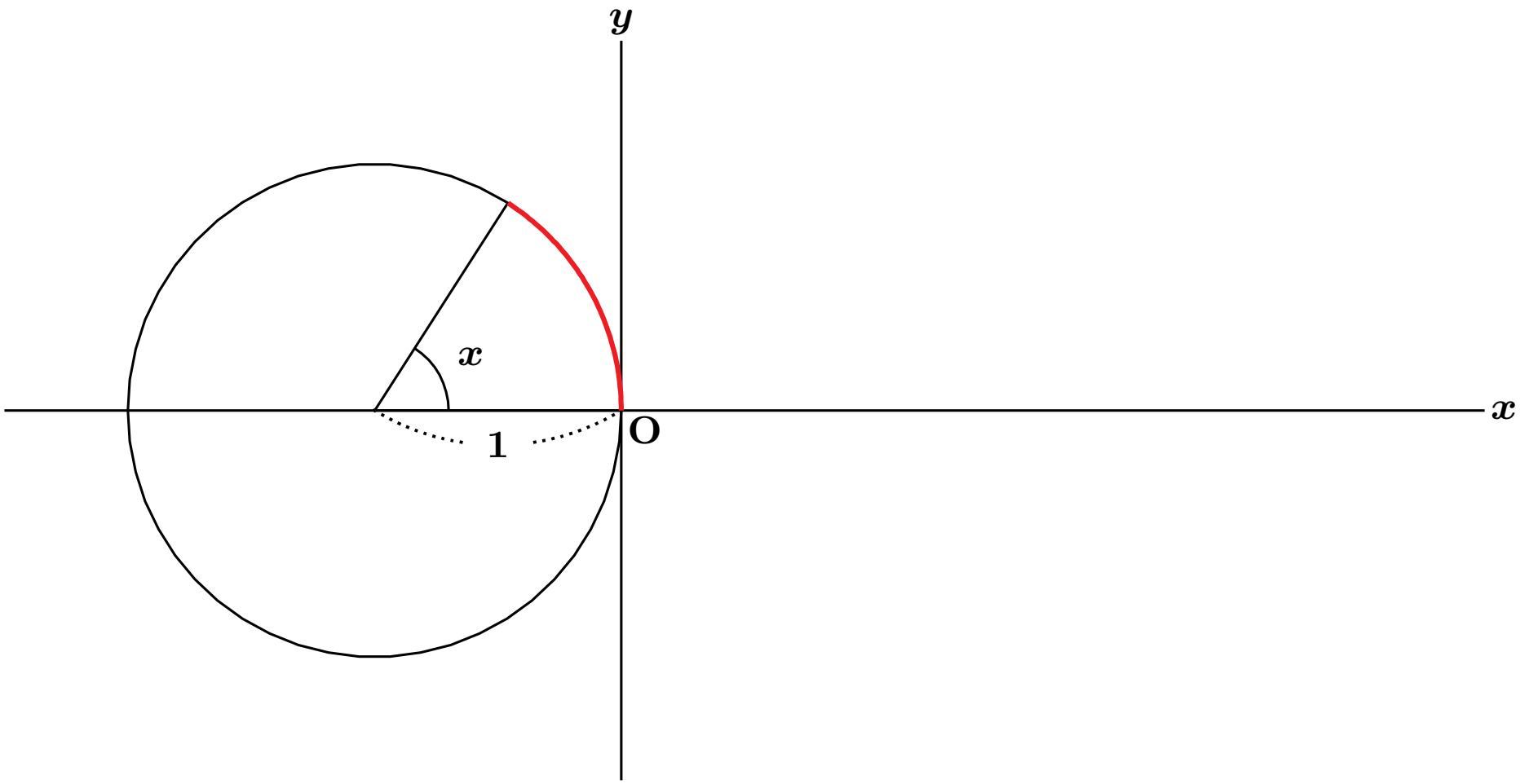


$y = \sin x$ のグラフのかき方

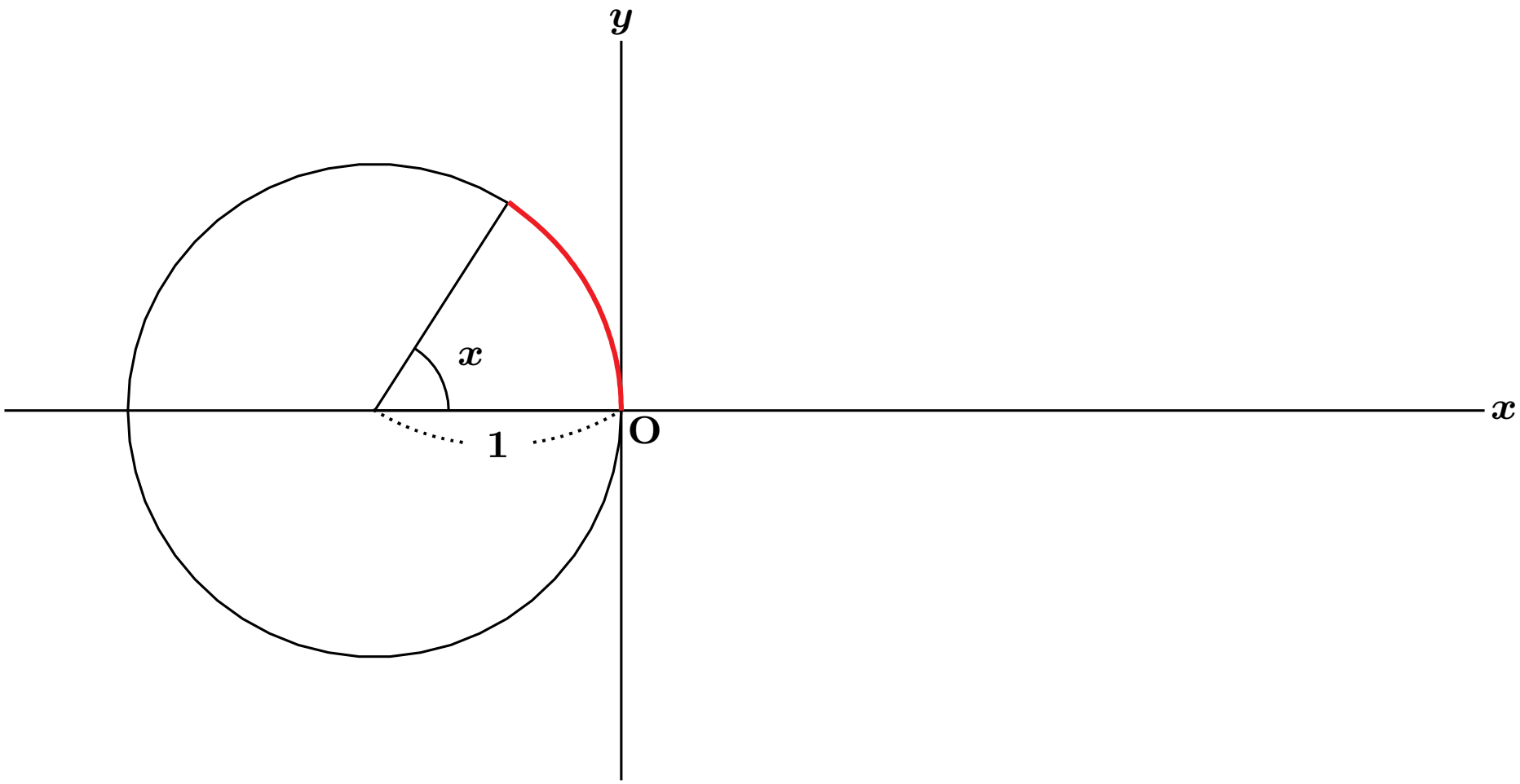
$$x = \frac{l}{r} = l$$



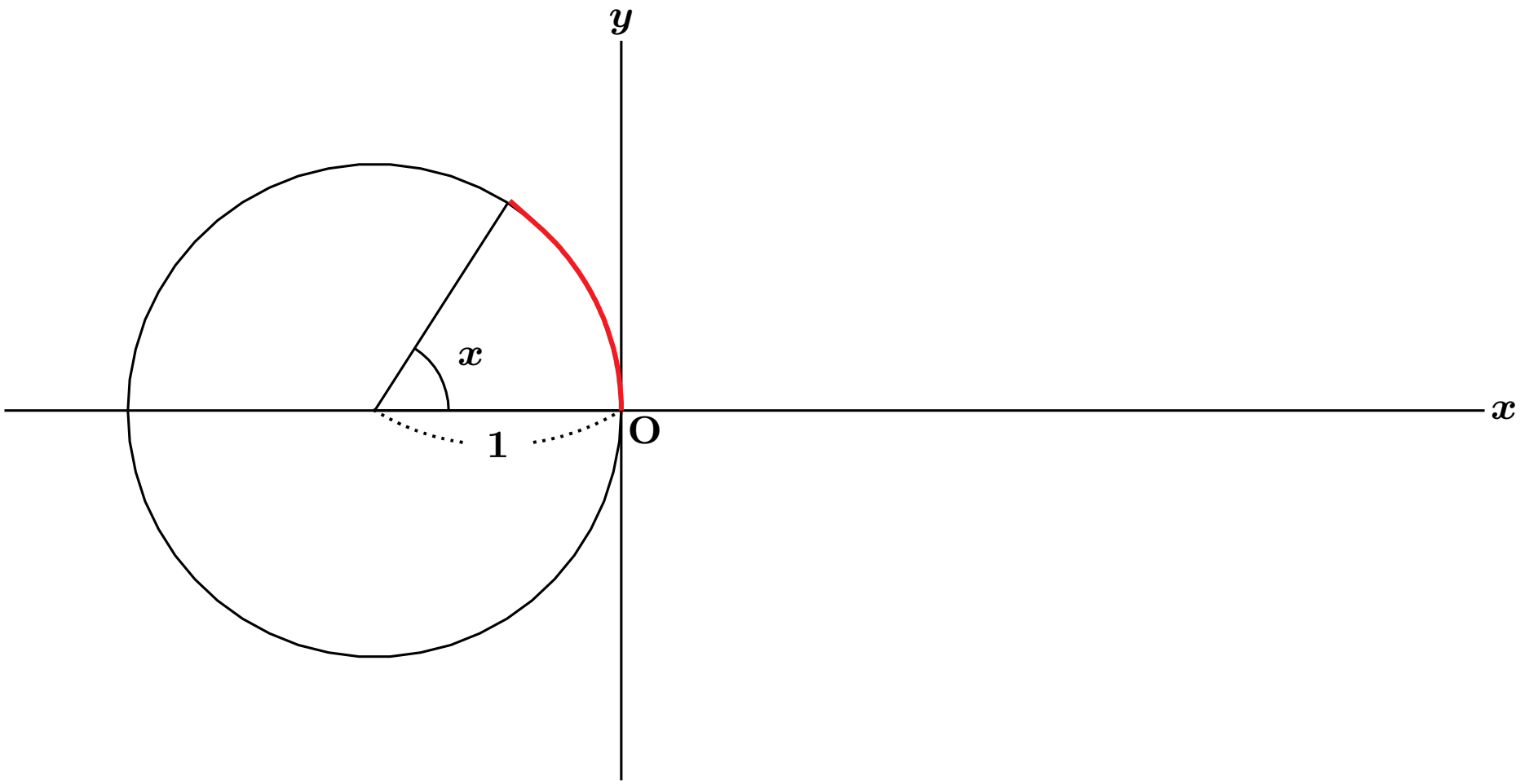
$y = \sin x$ のグラフのかき方



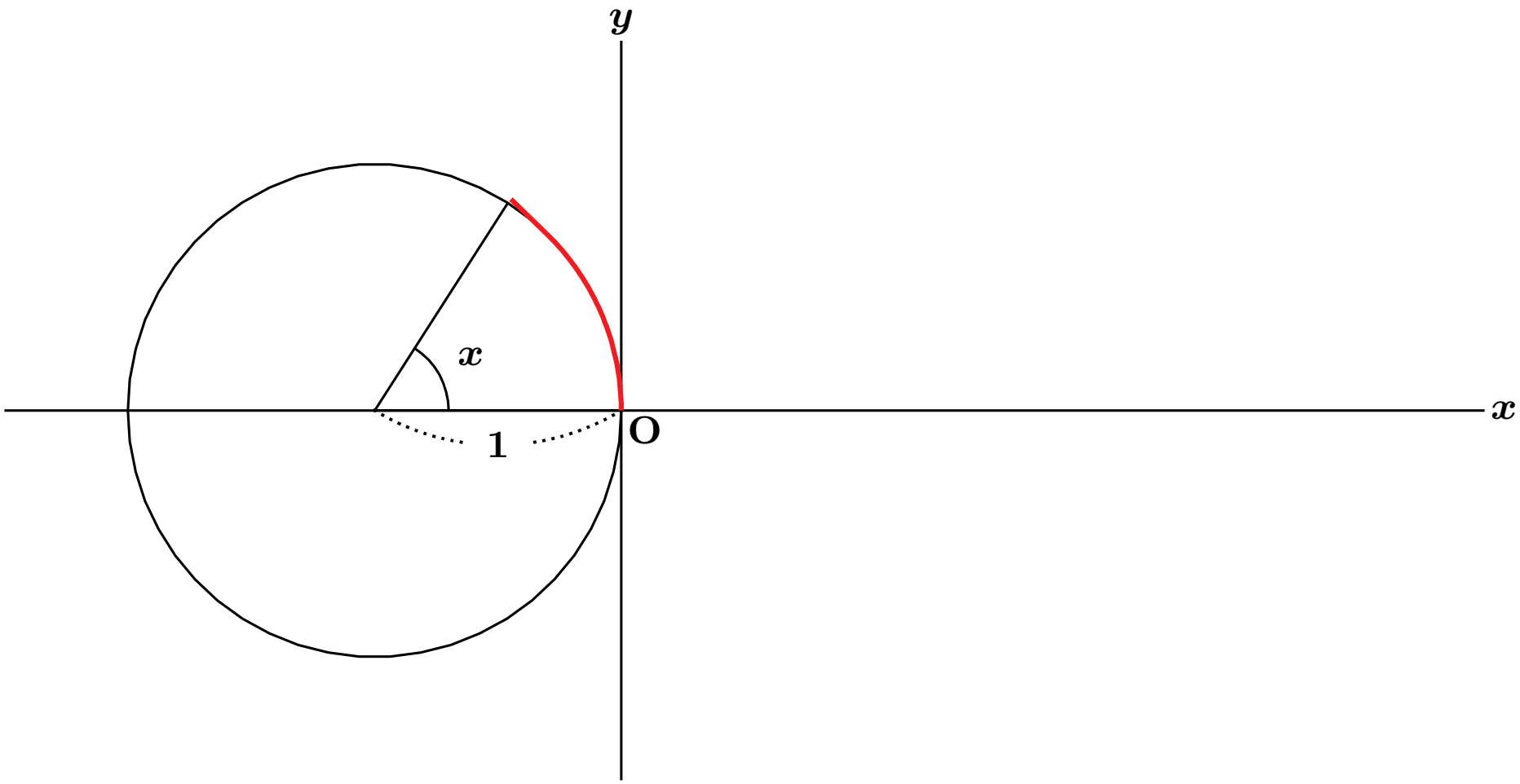
$y = \sin x$ のグラフのかき方



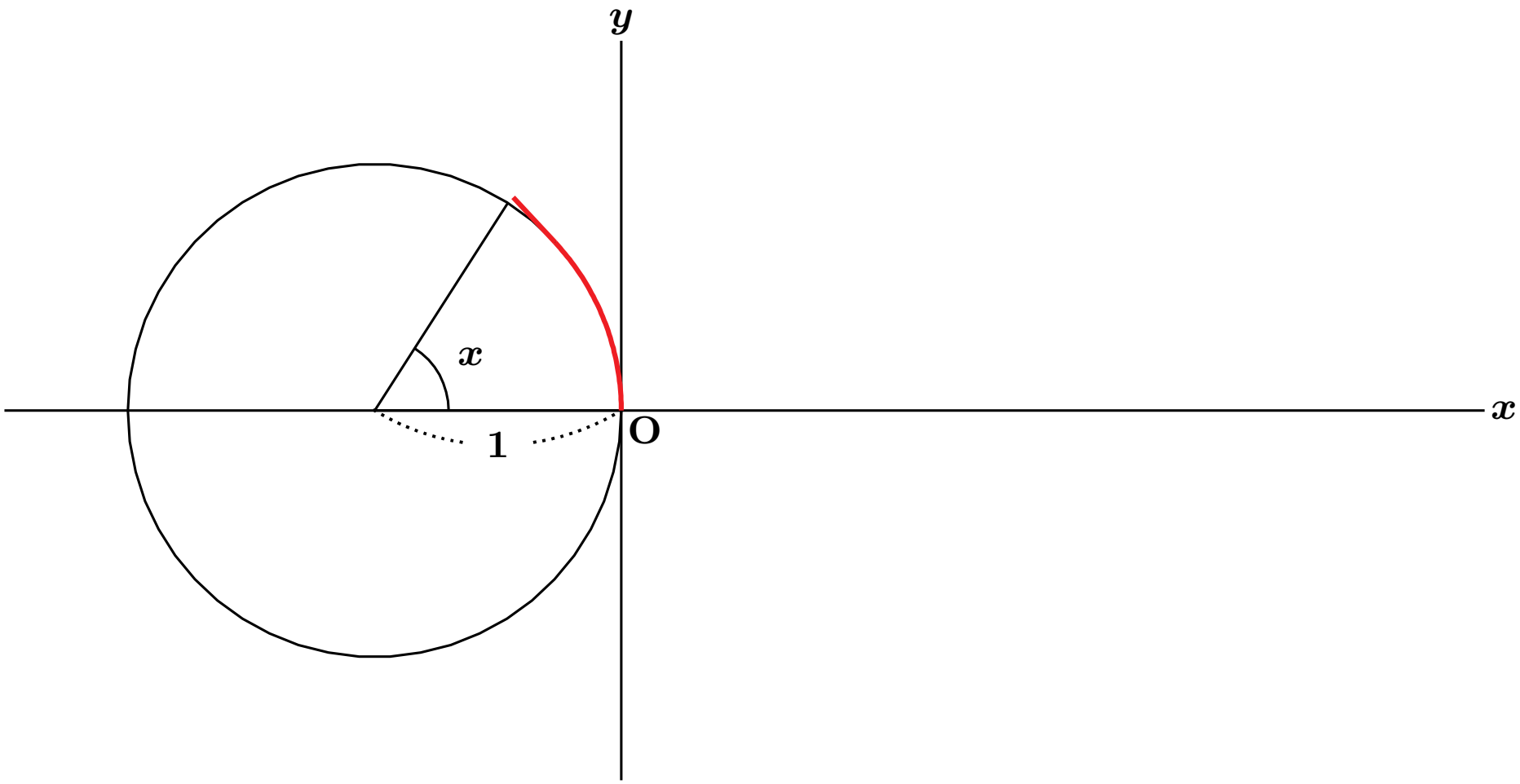
$y = \sin x$ のグラフのかき方



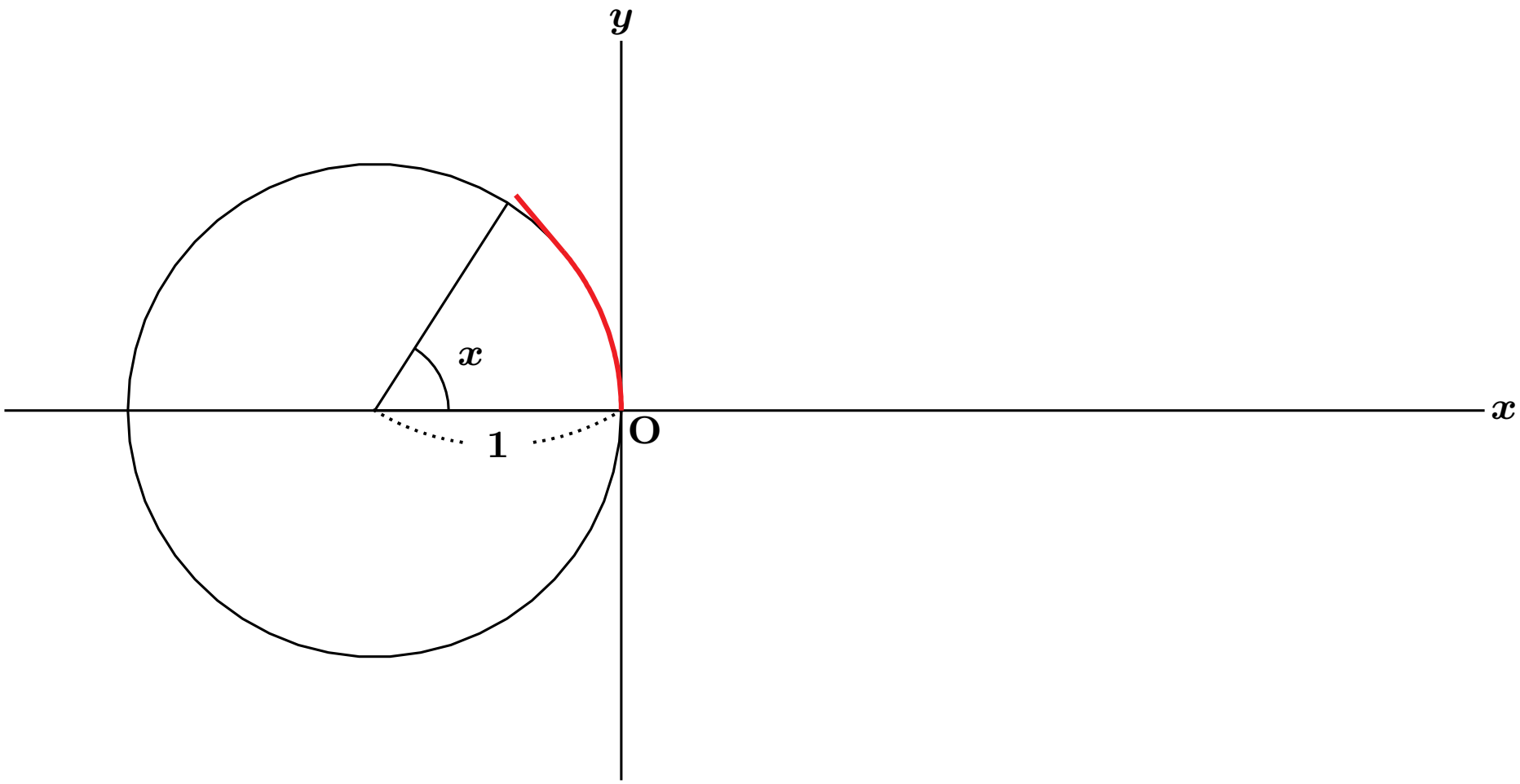
$y = \sin x$ のグラフのかき方



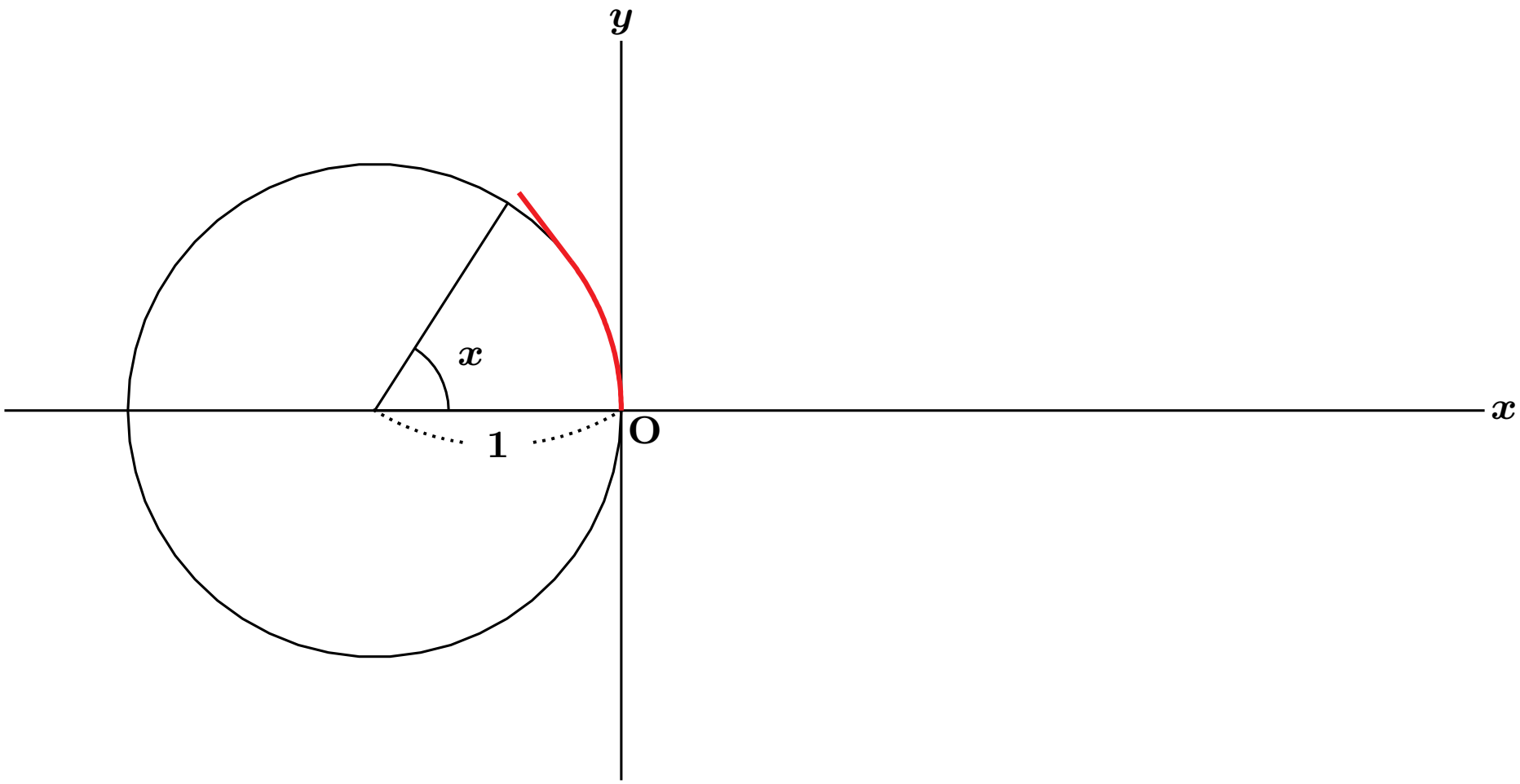
$y = \sin x$ のグラフのかき方



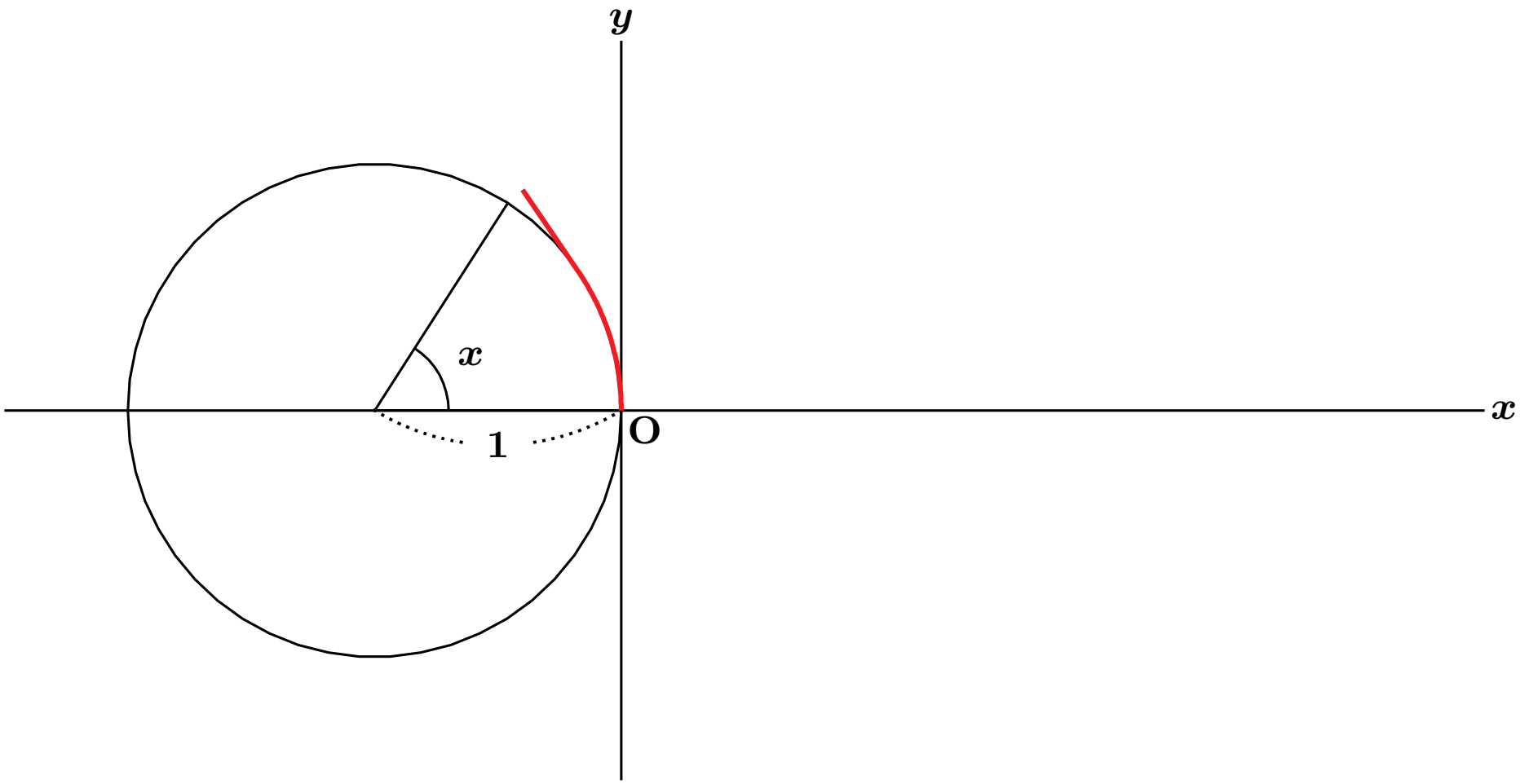
$y = \sin x$ のグラフのかき方



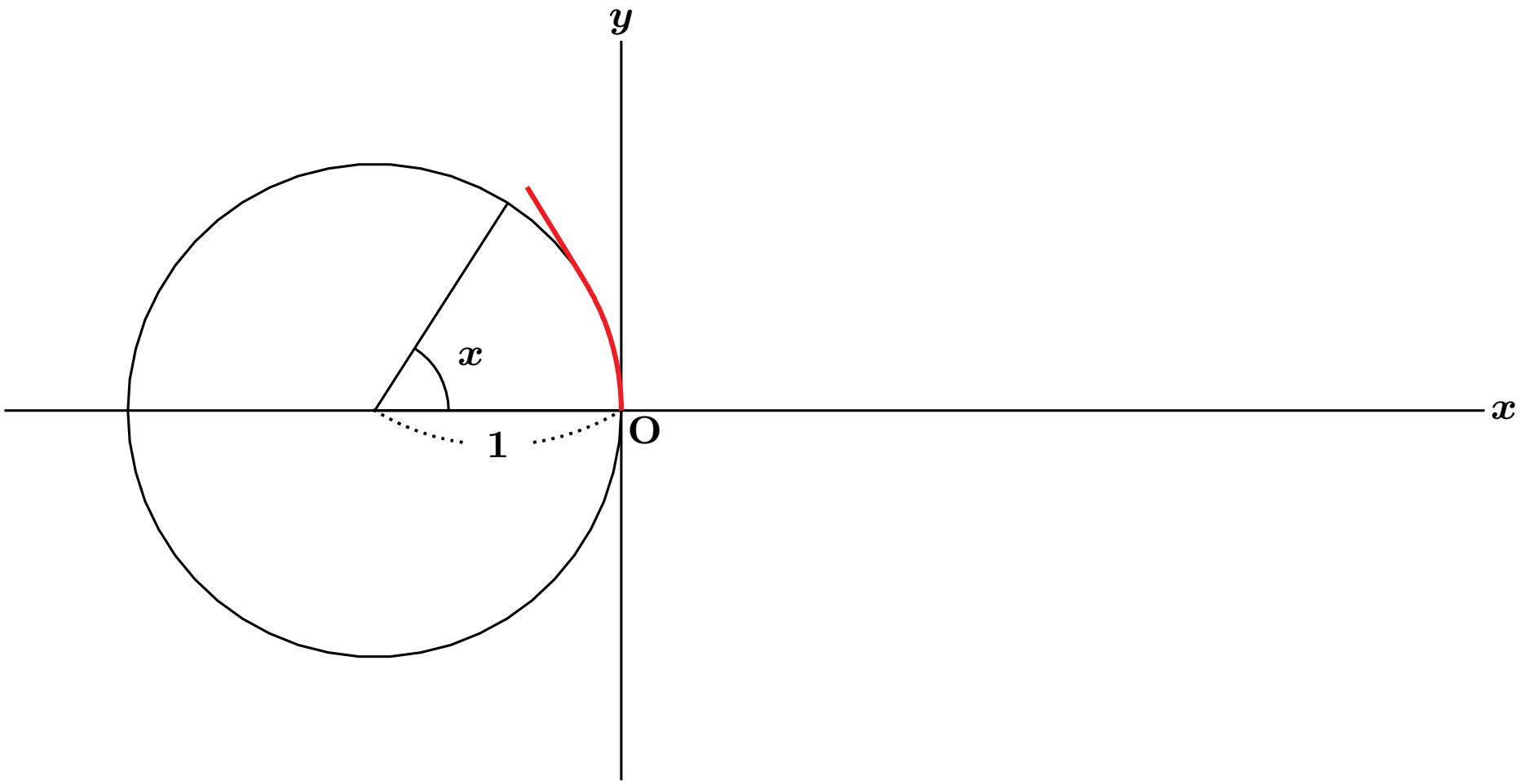
$y = \sin x$ のグラフのかき方



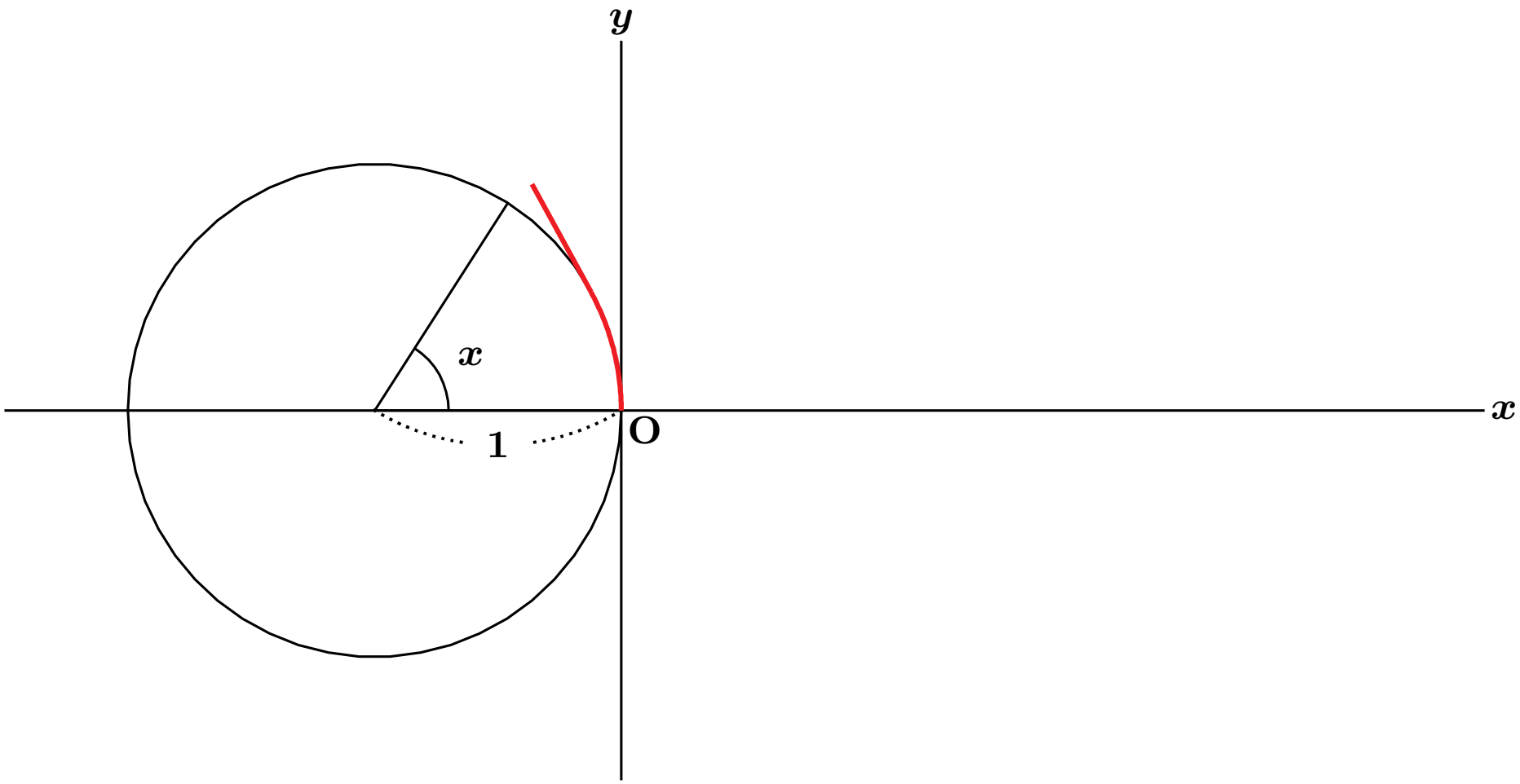
$y = \sin x$ のグラフのかき方



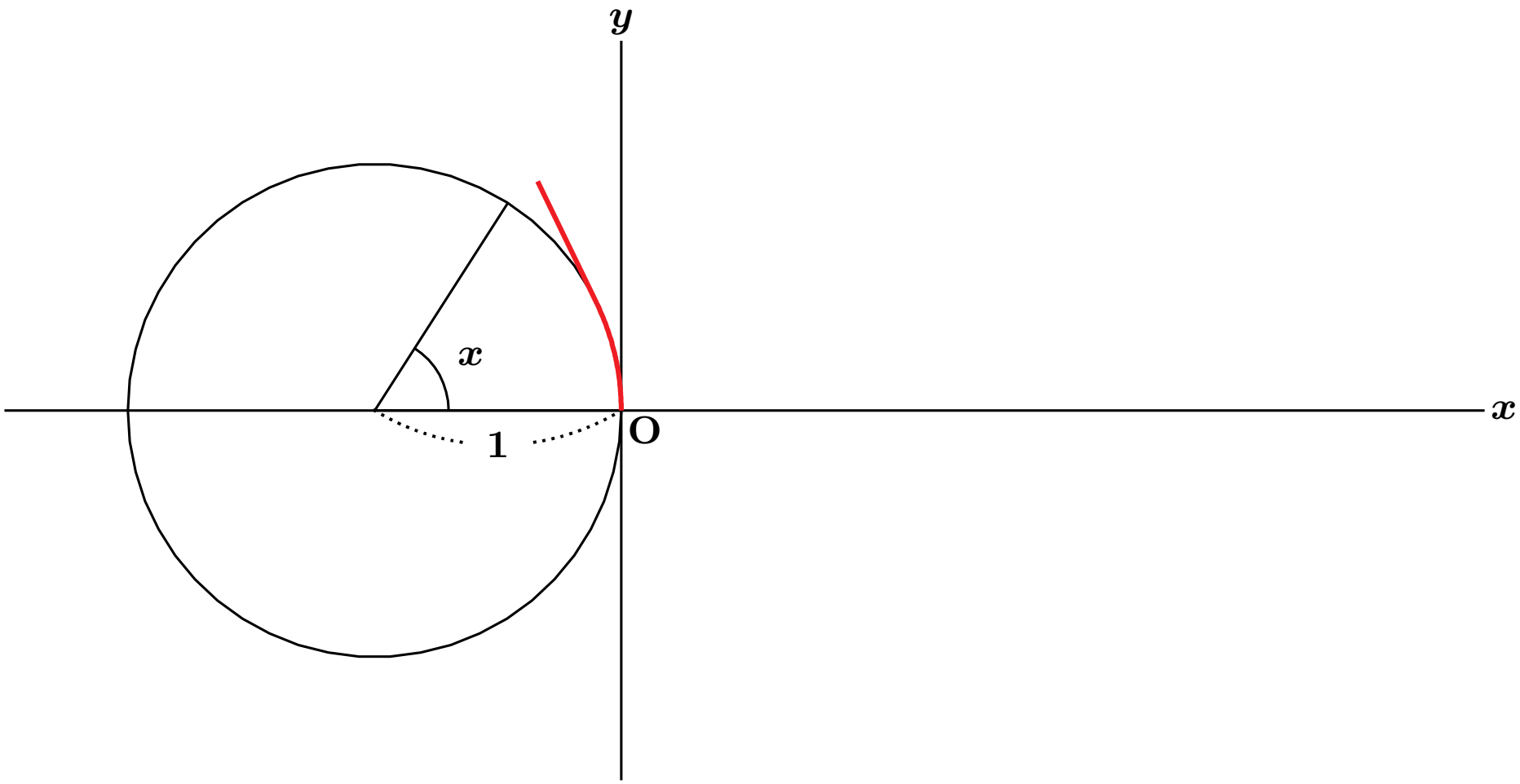
$y = \sin x$ のグラフのかき方



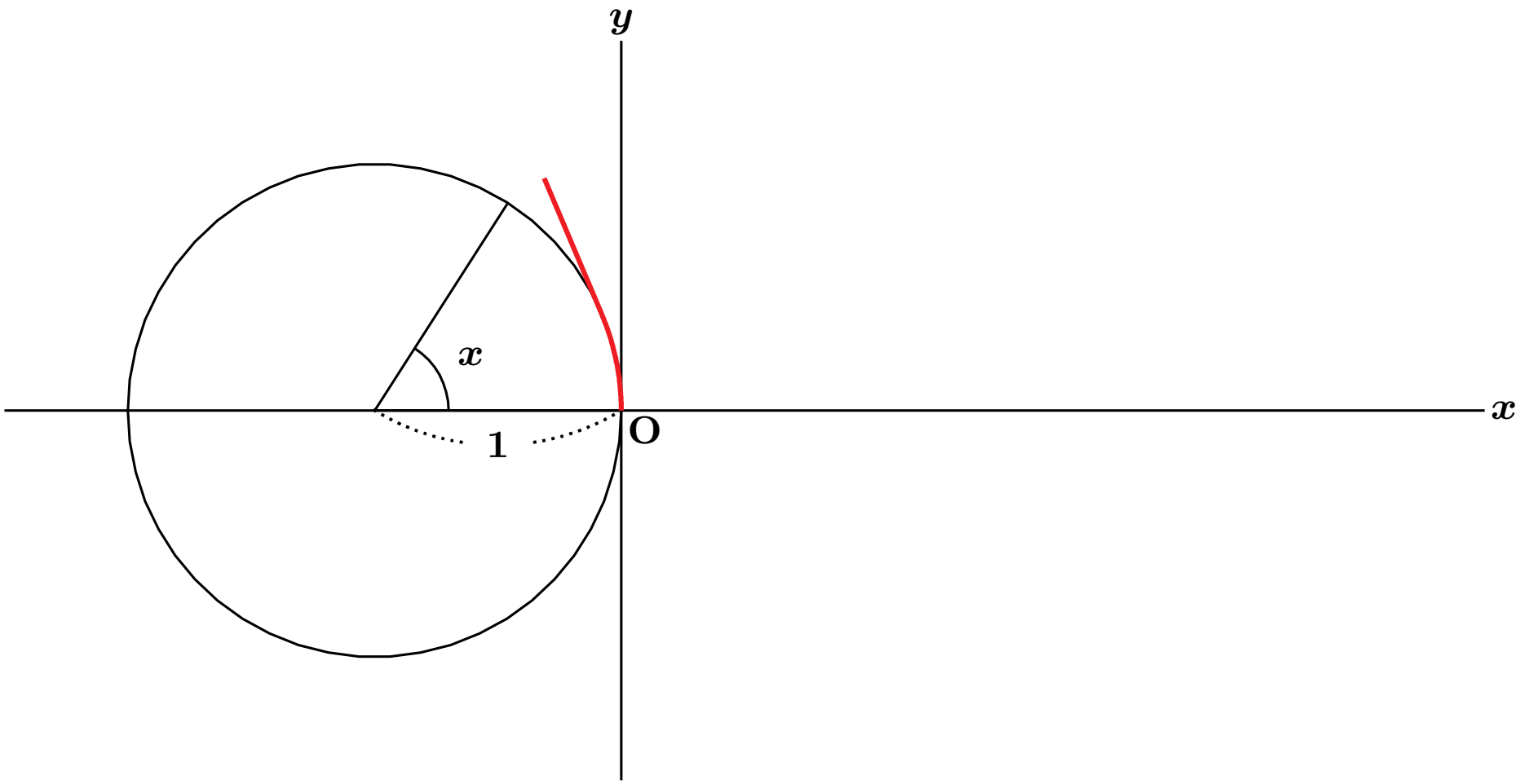
$y = \sin x$ のグラフのかき方



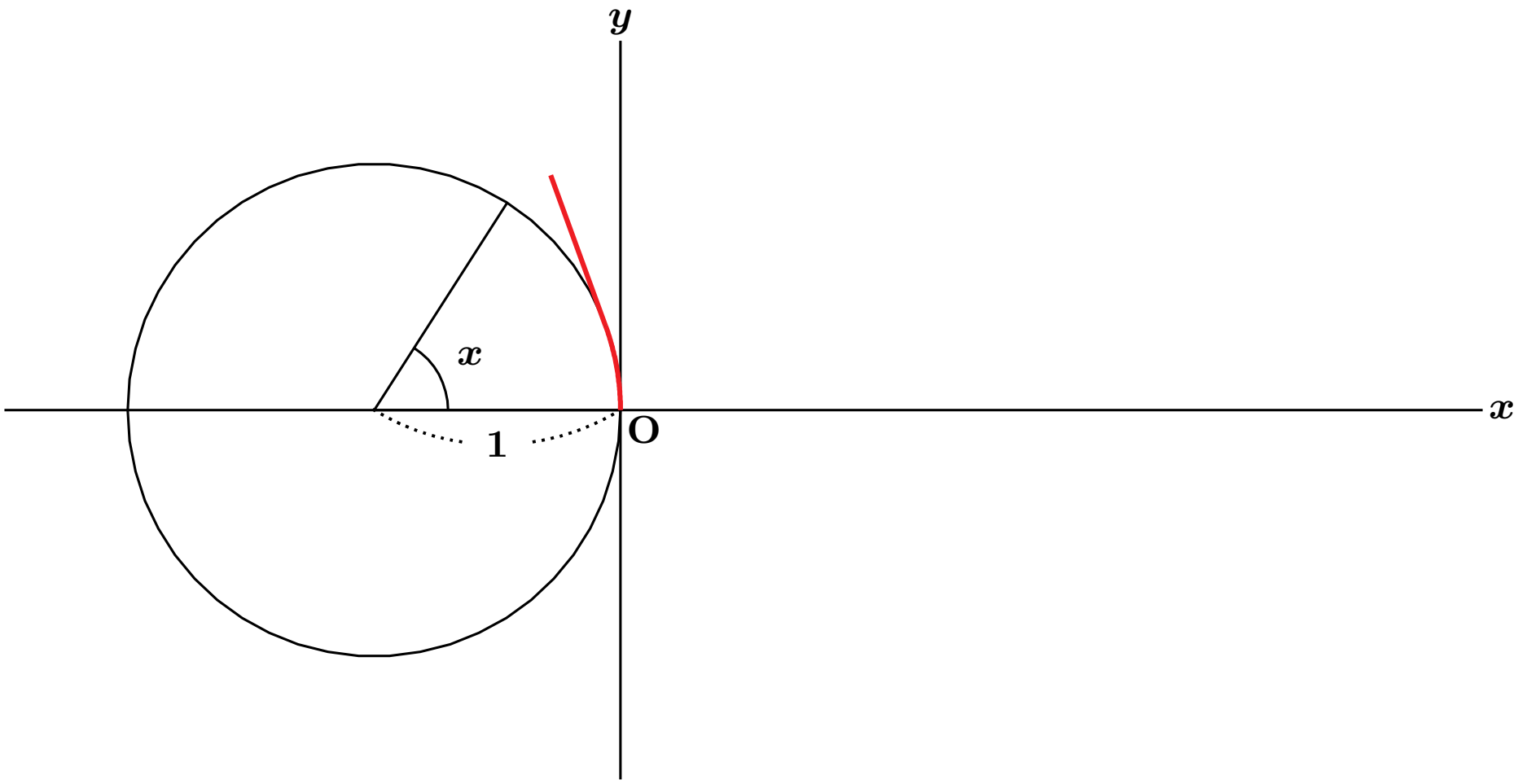
$y = \sin x$ のグラフのかき方



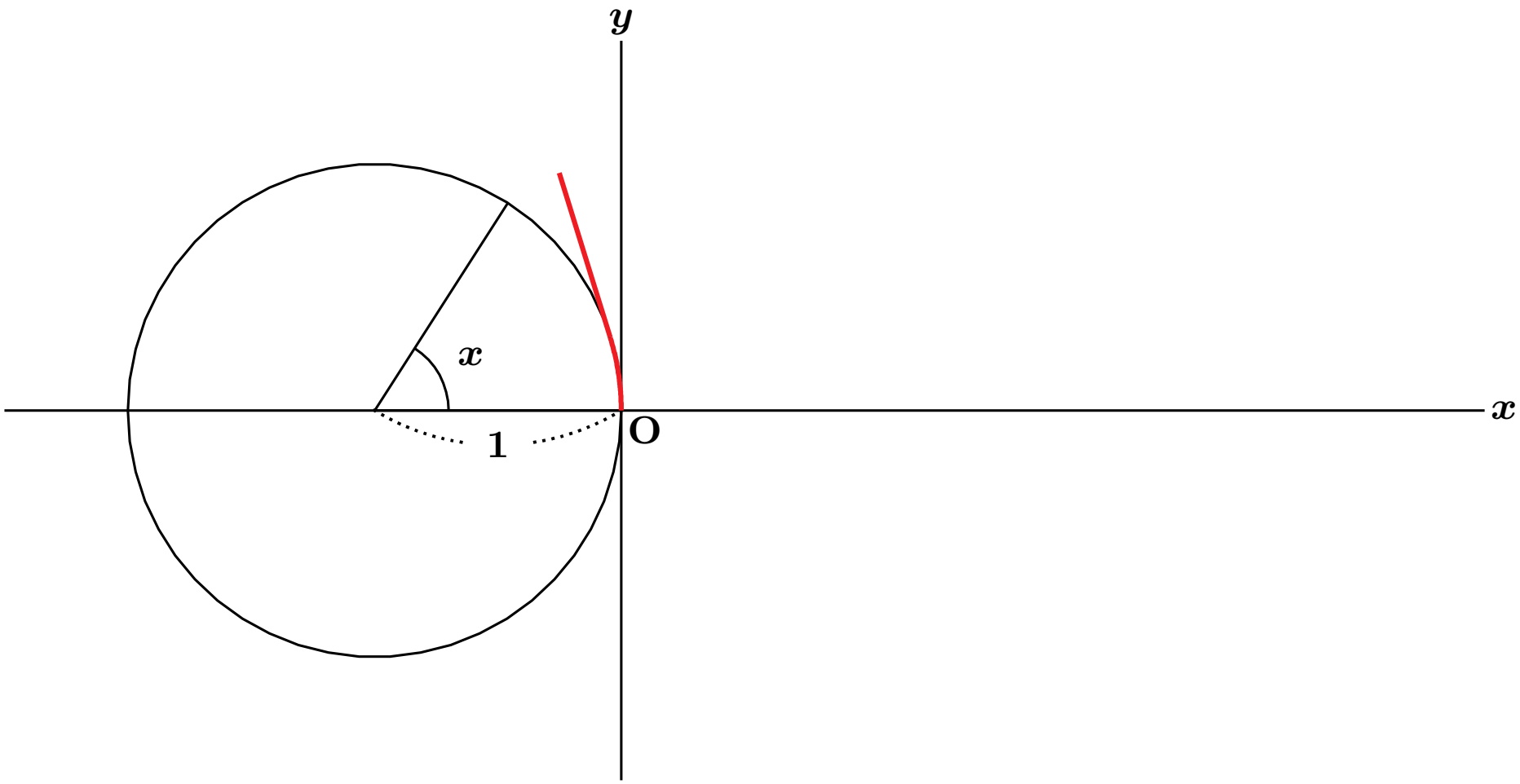
$y = \sin x$ のグラフのかき方



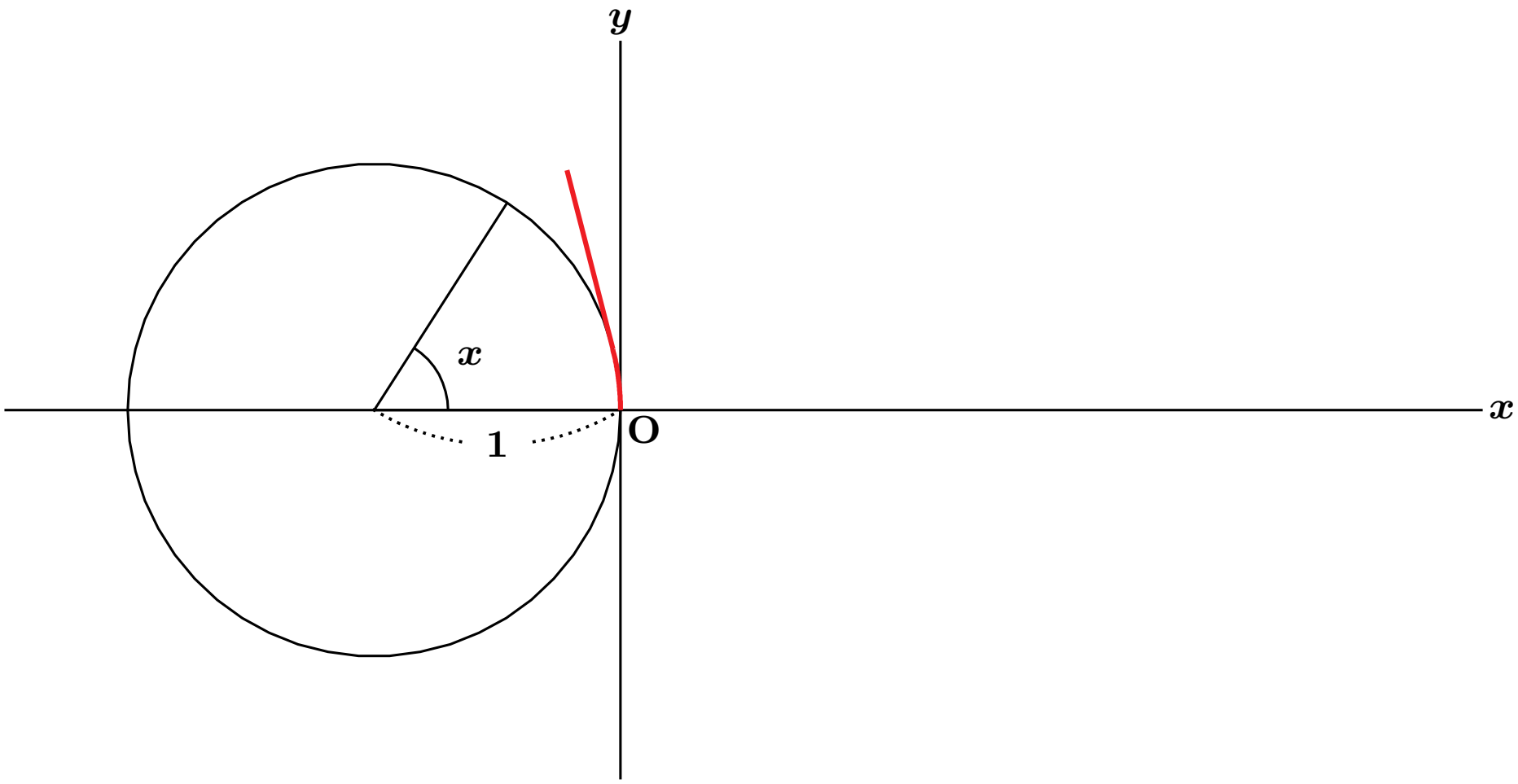
$y = \sin x$ のグラフのかき方



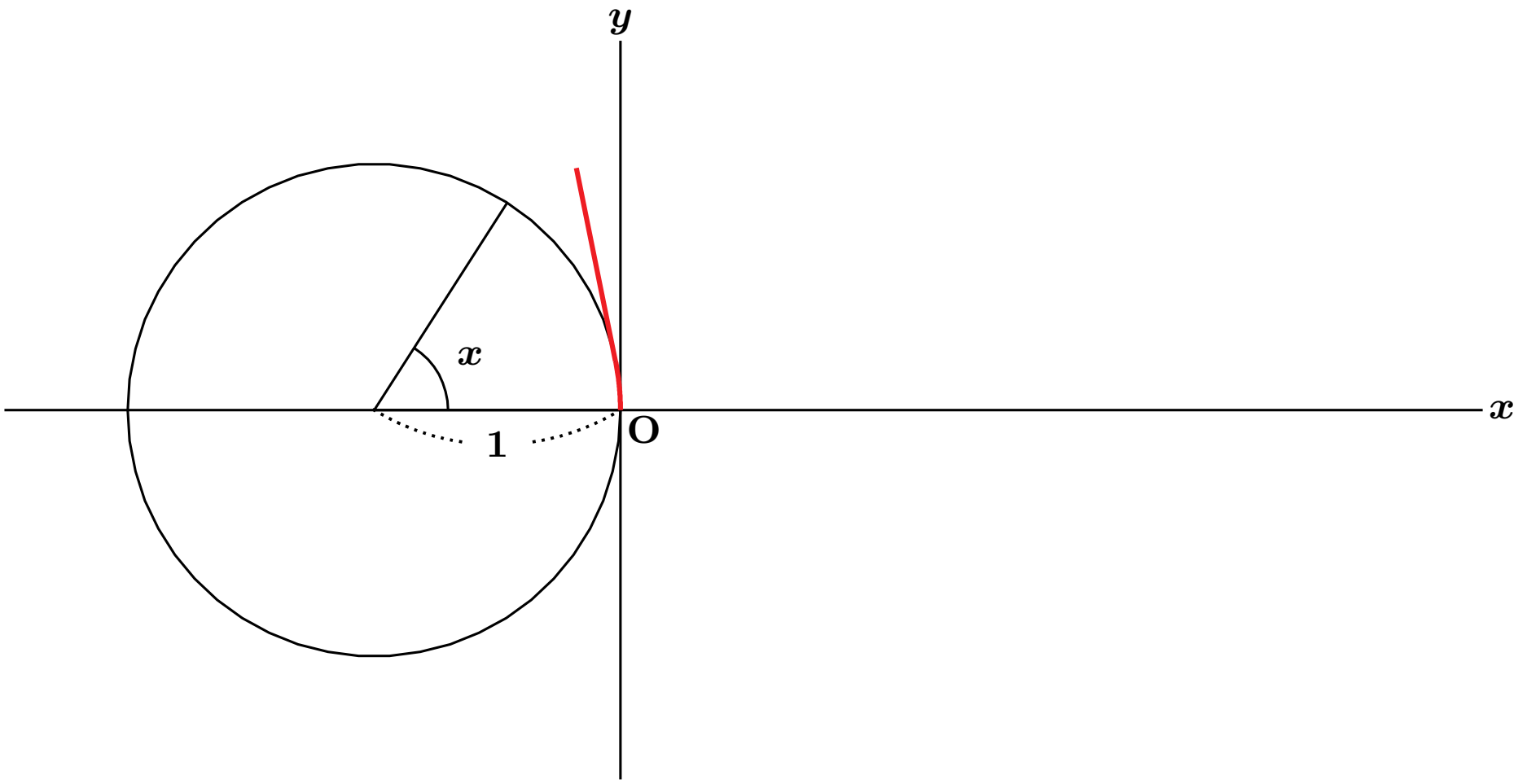
$y = \sin x$ のグラフのかき方



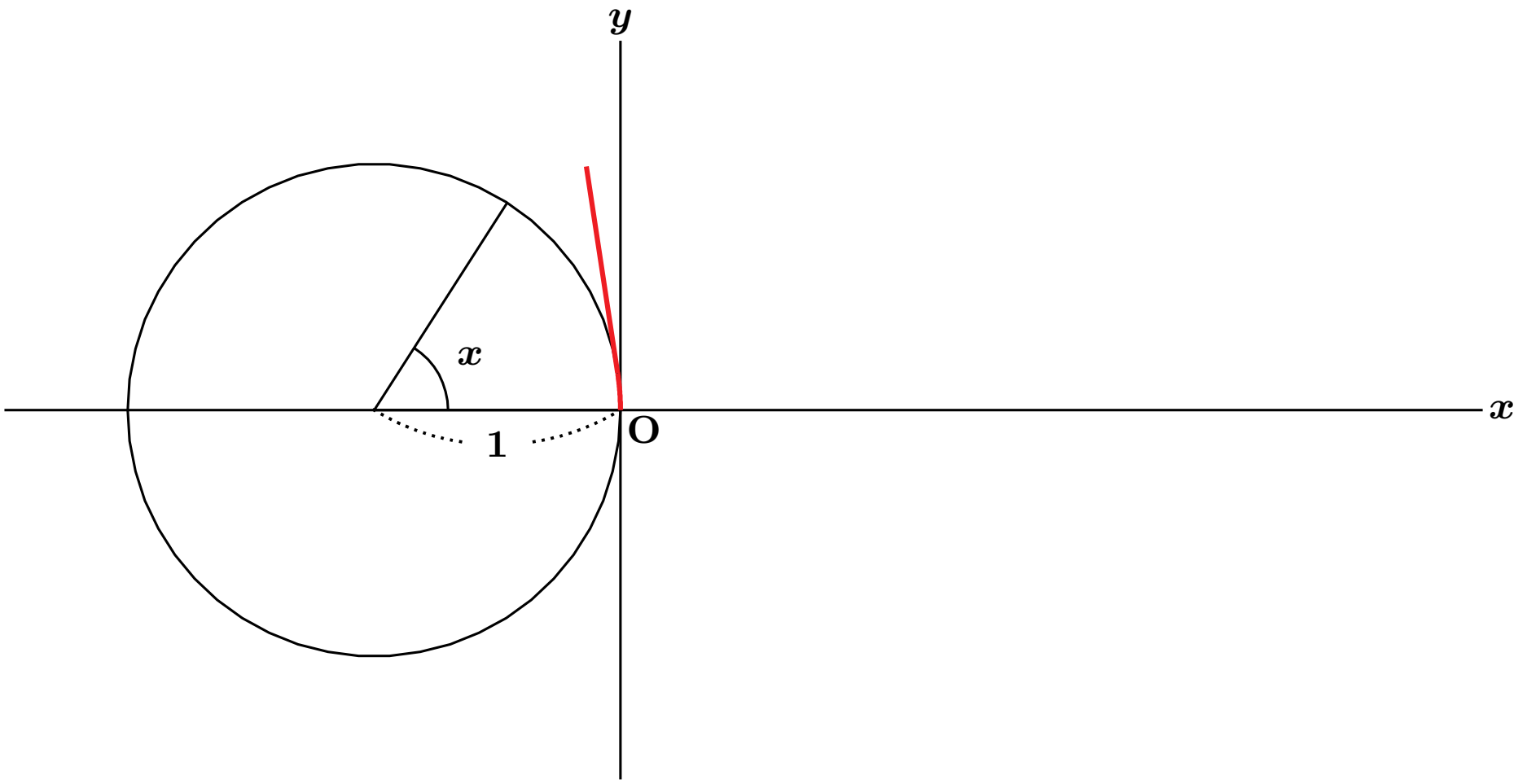
$y = \sin x$ のグラフのかき方



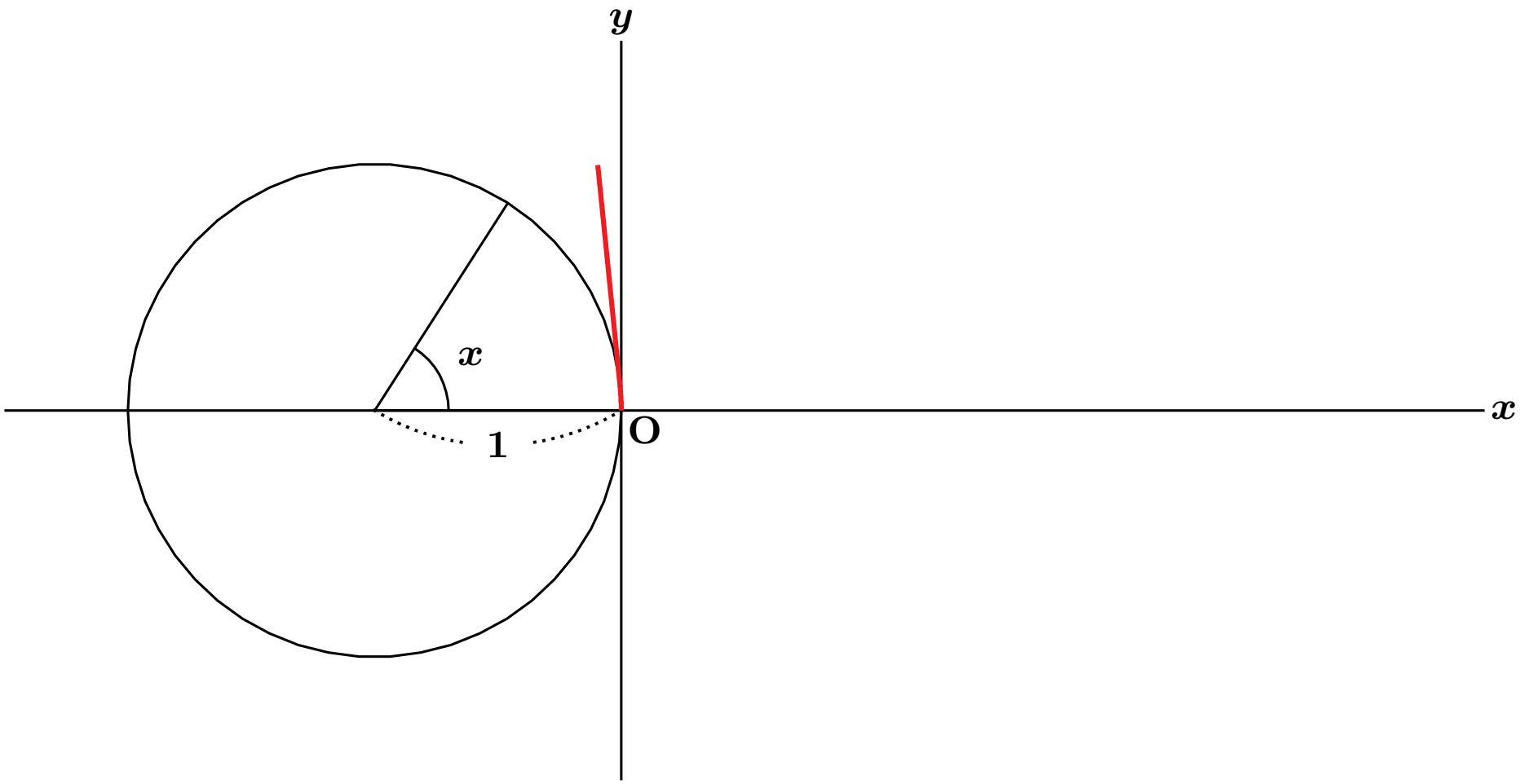
$y = \sin x$ のグラフのかき方



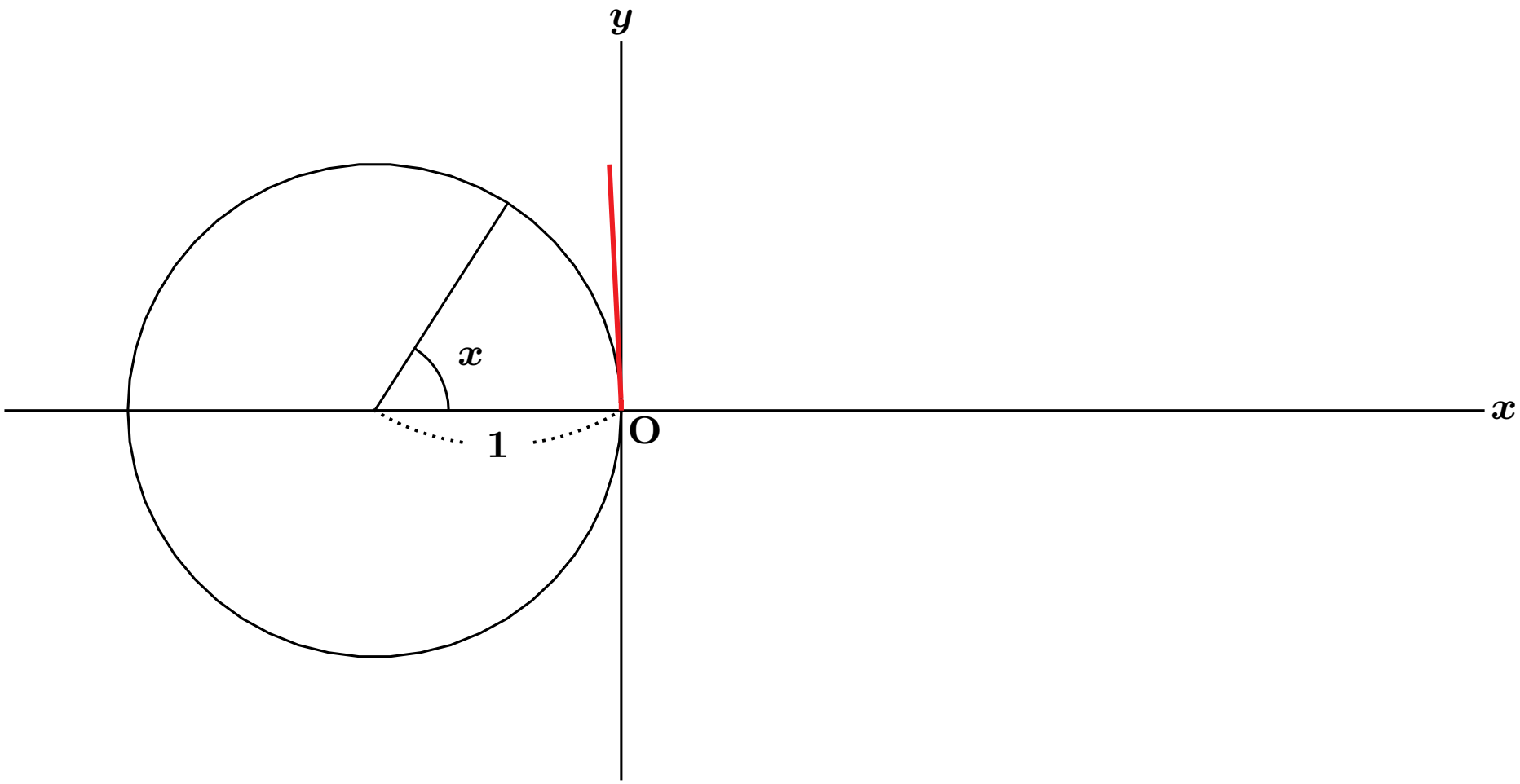
$y = \sin x$ のグラフのかき方



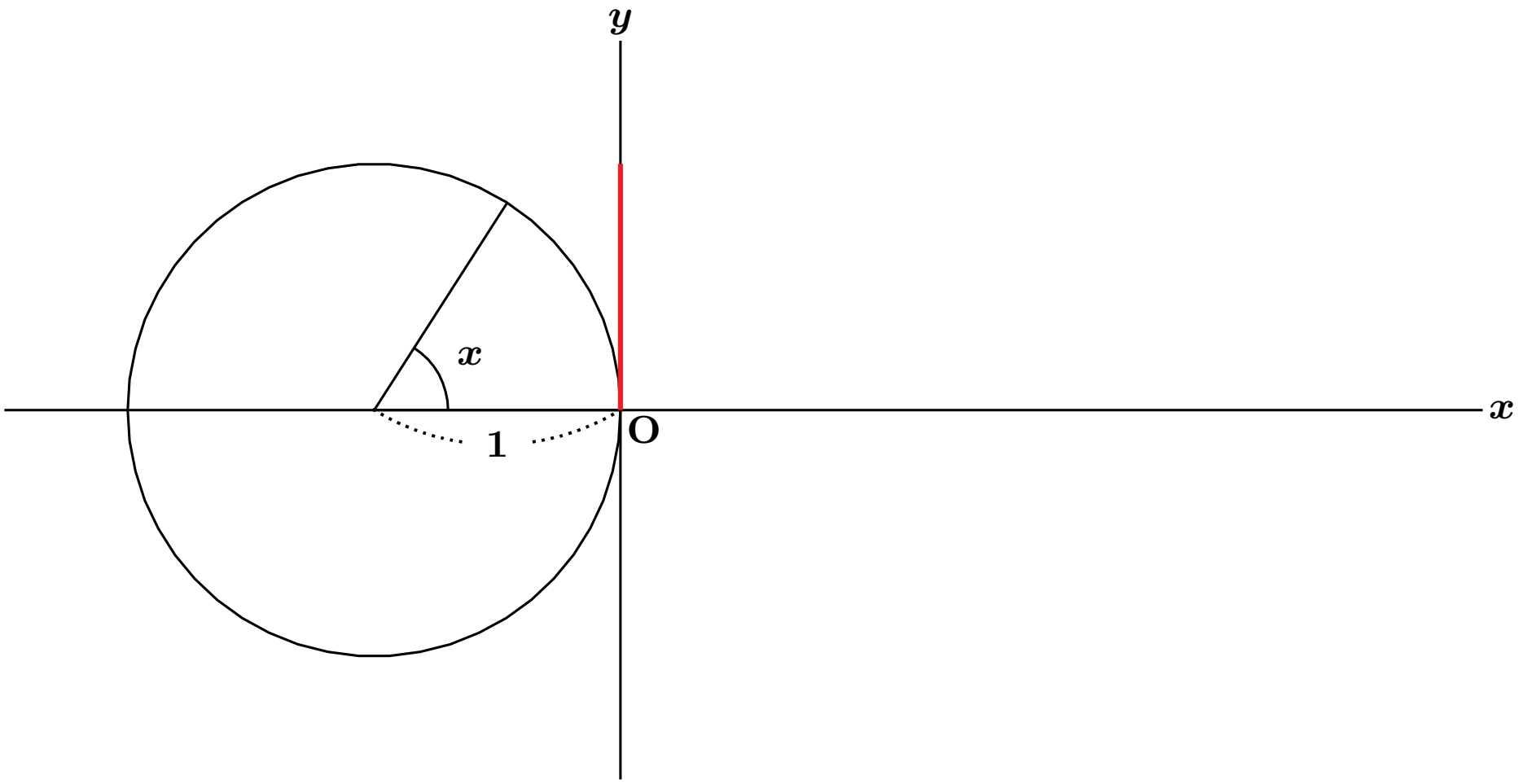
$y = \sin x$ のグラフのかき方



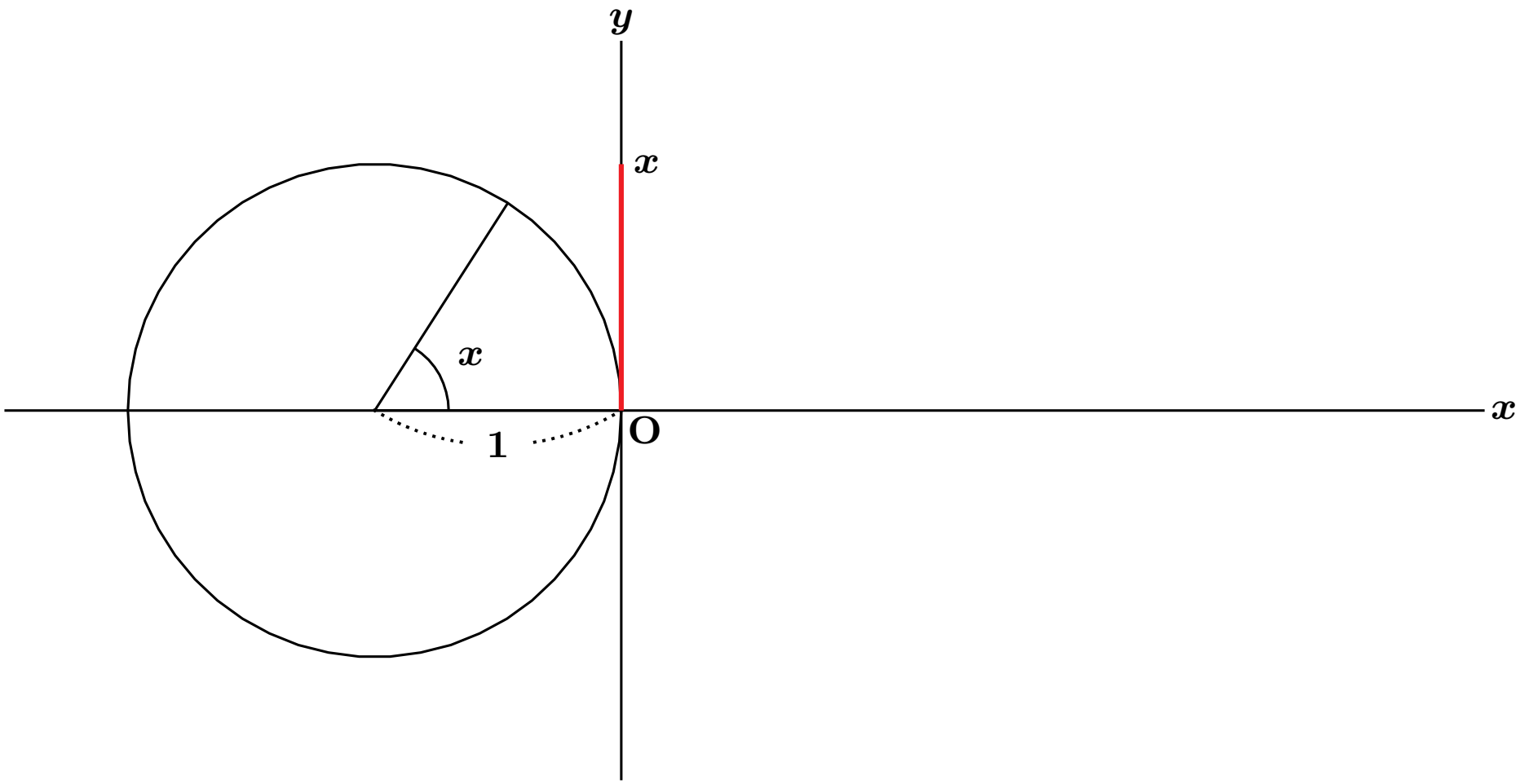
$y = \sin x$ のグラフのかき方



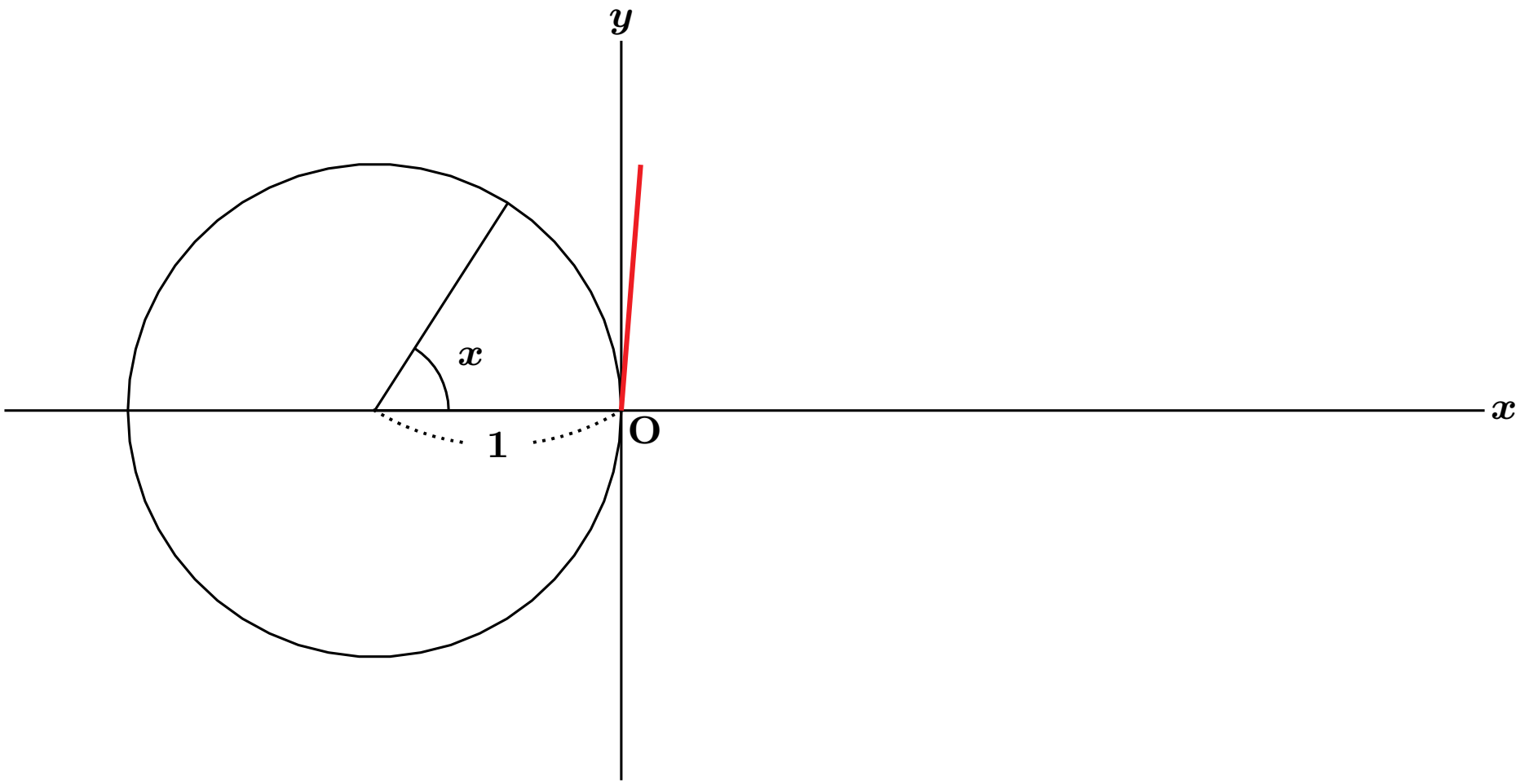
$y = \sin x$ のグラフのかき方



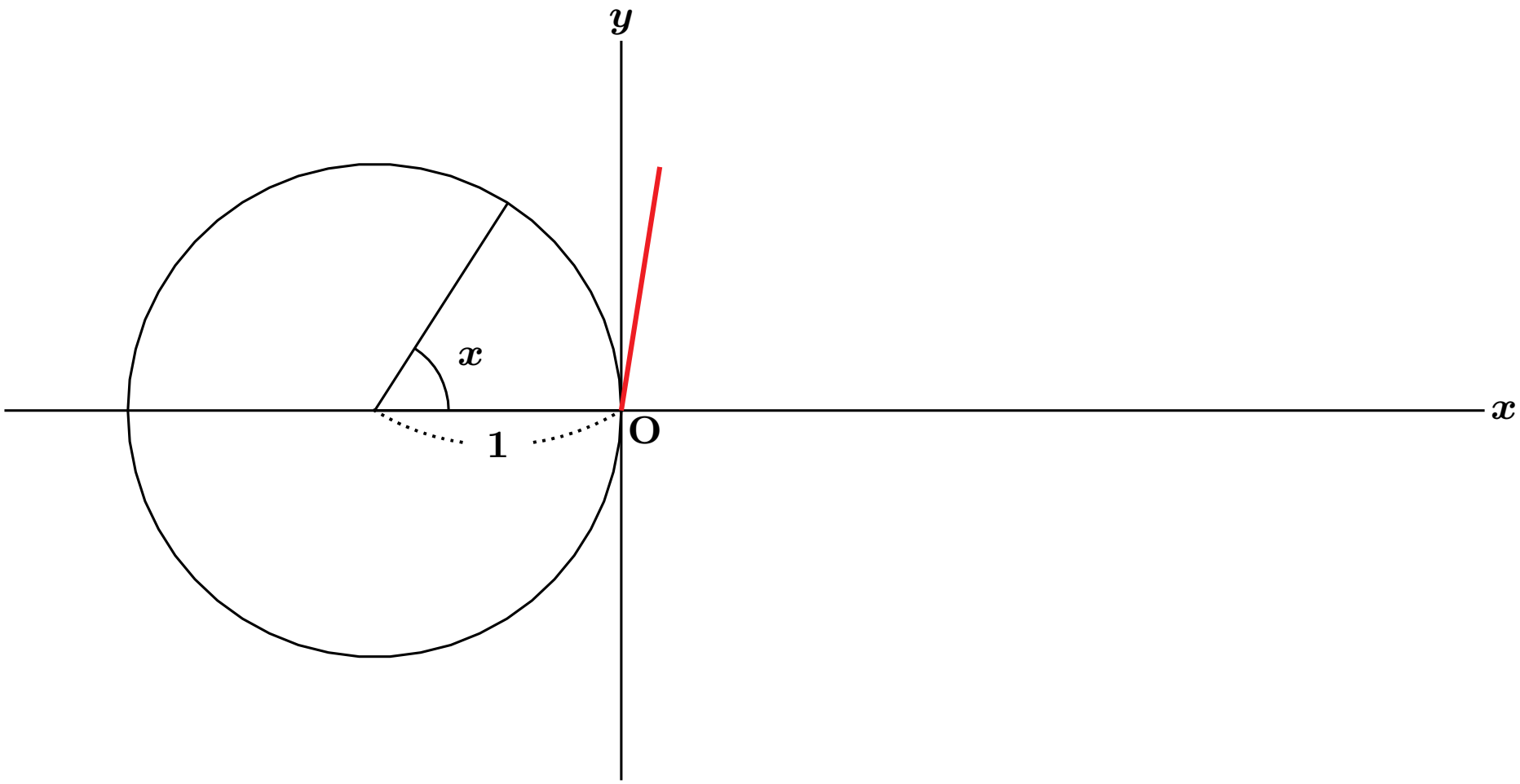
$y = \sin x$ のグラフのかき方



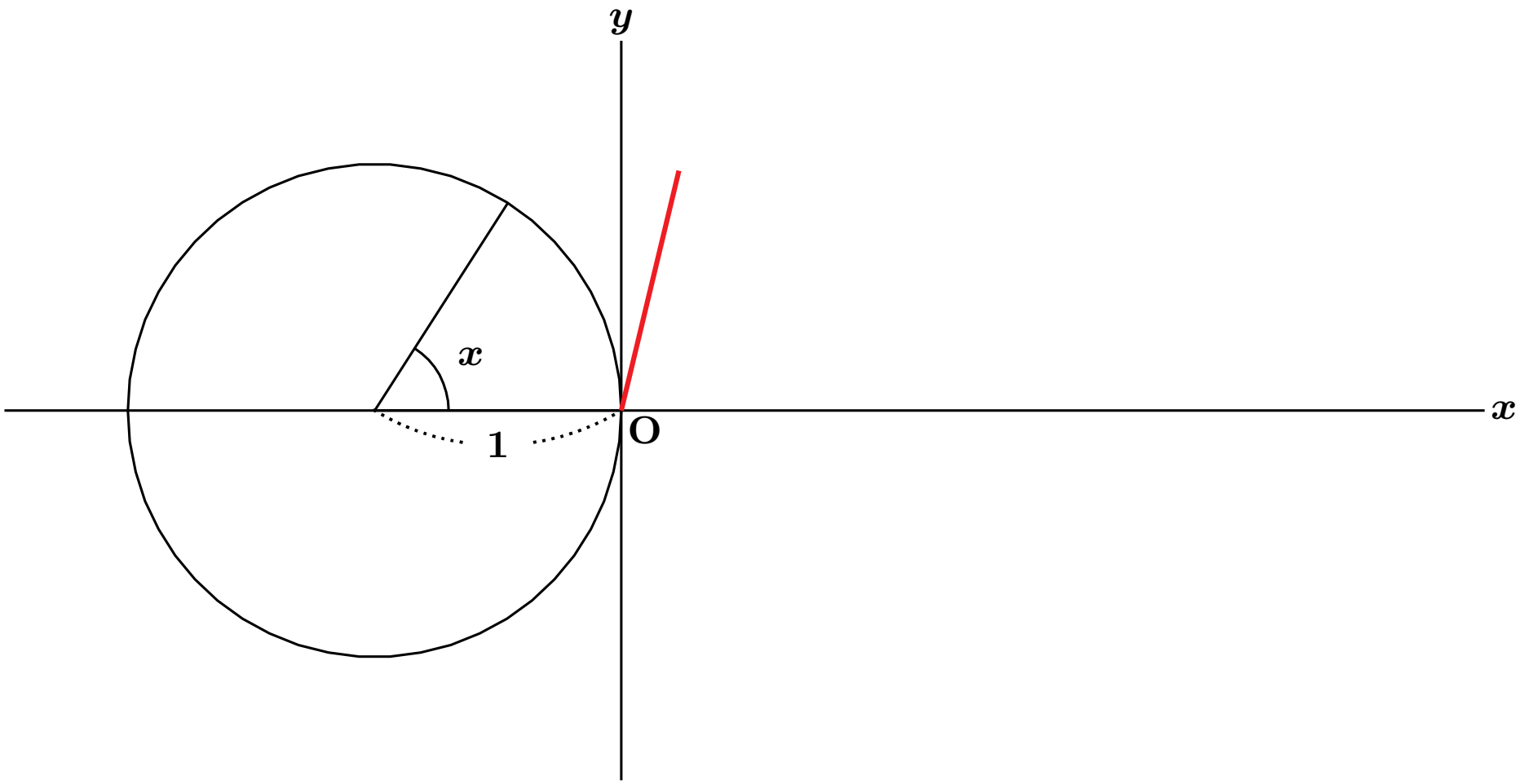
$y = \sin x$ のグラフのかき方



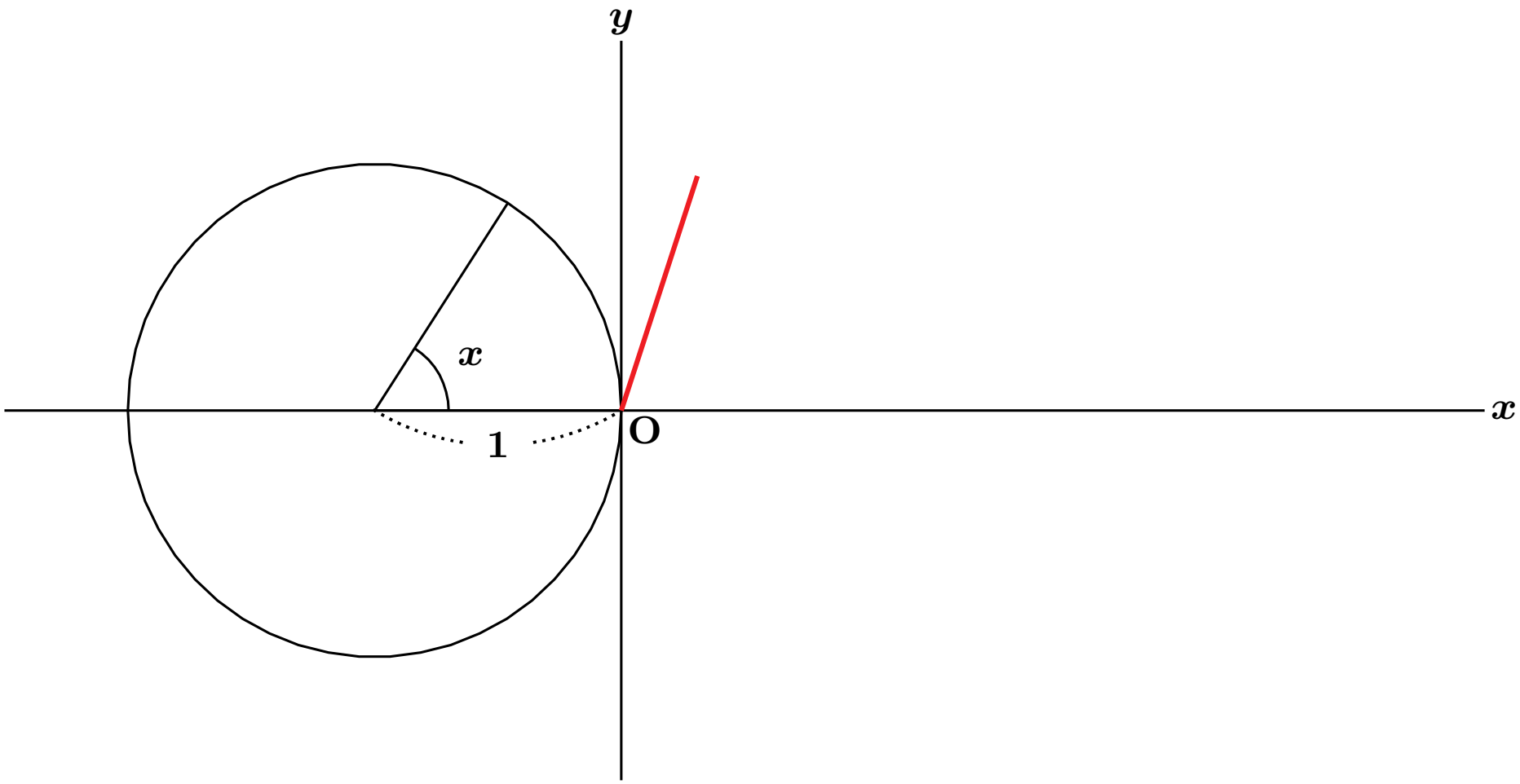
$y = \sin x$ のグラフのかき方



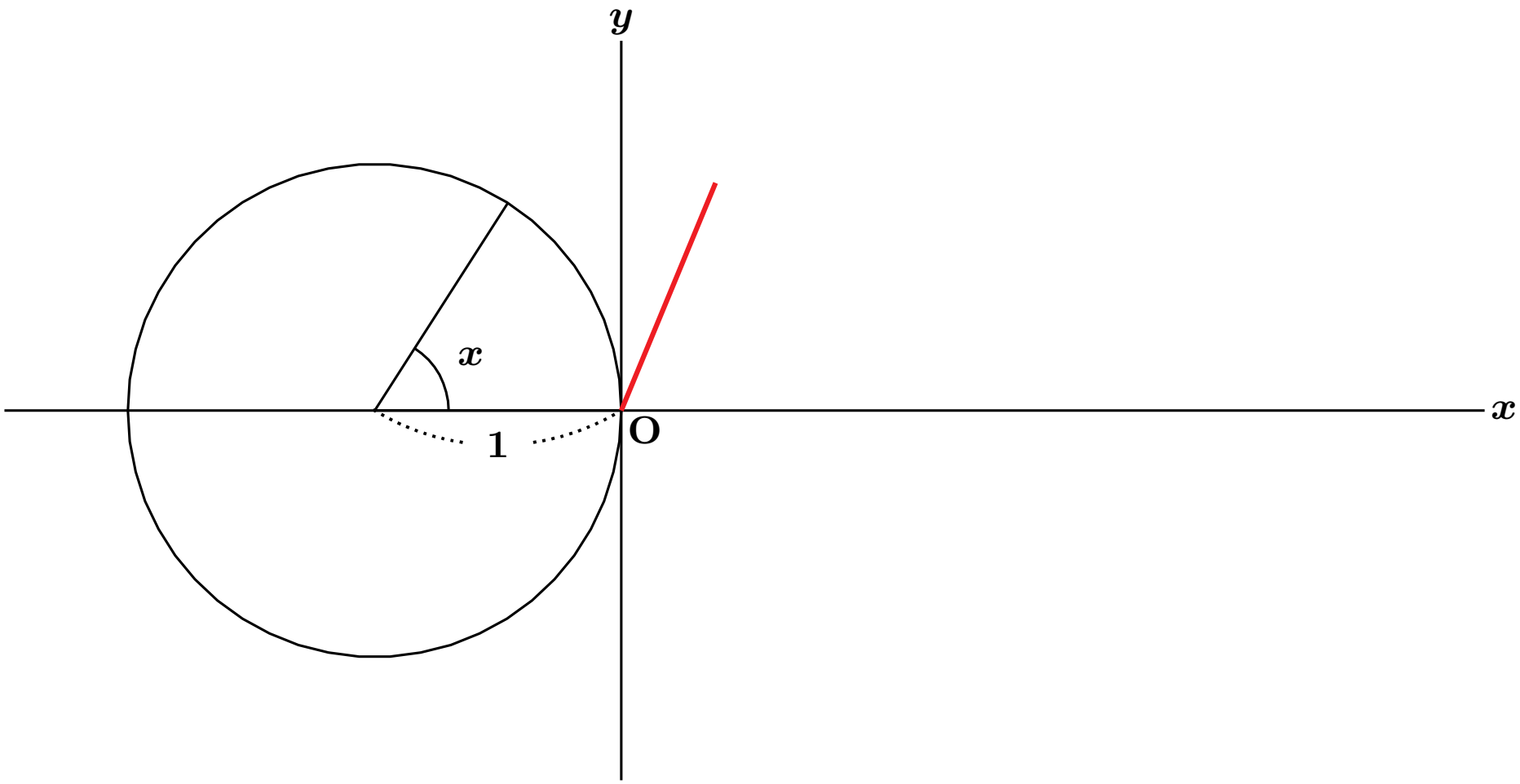
$y = \sin x$ のグラフのかき方



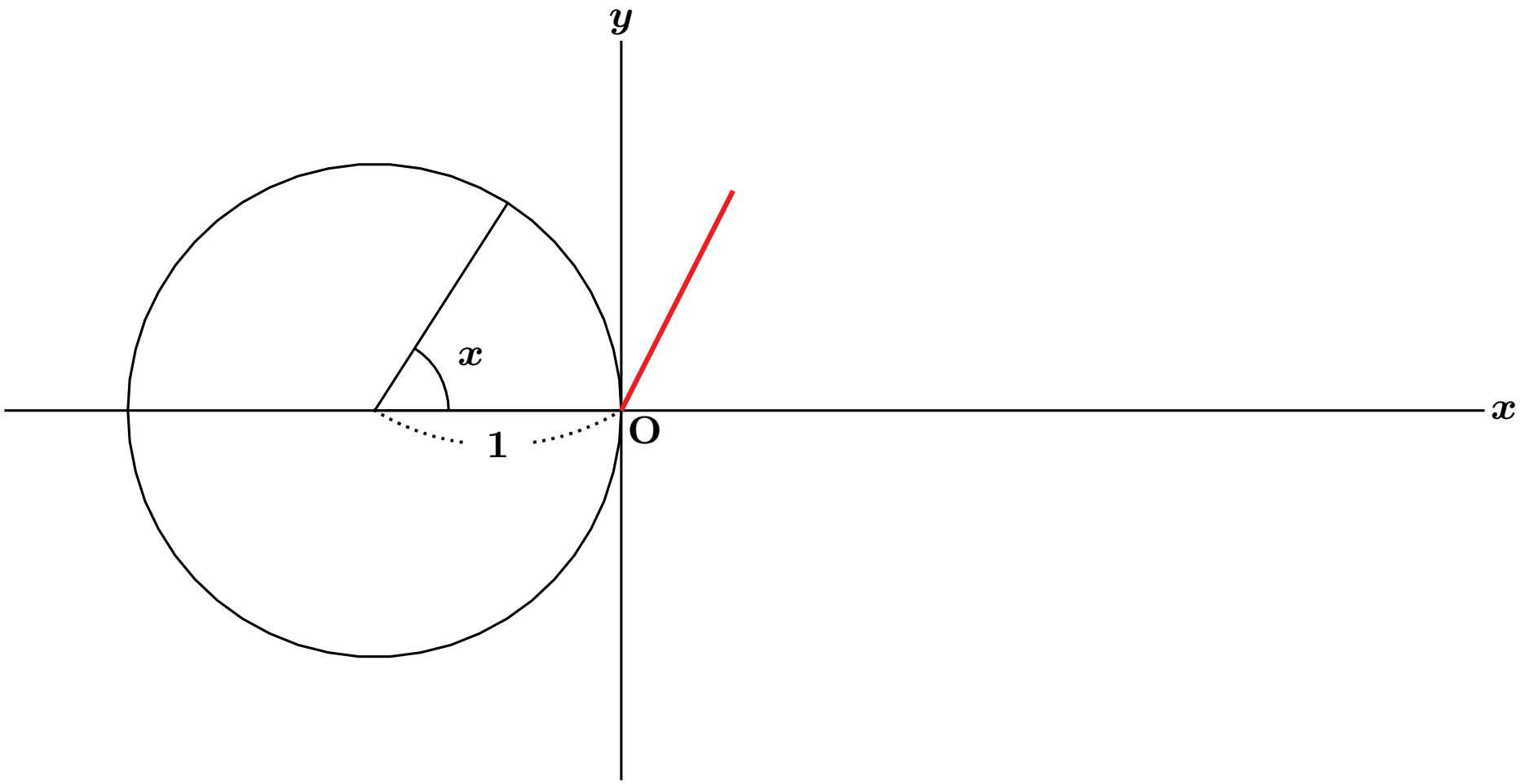
$y = \sin x$ のグラフのかき方



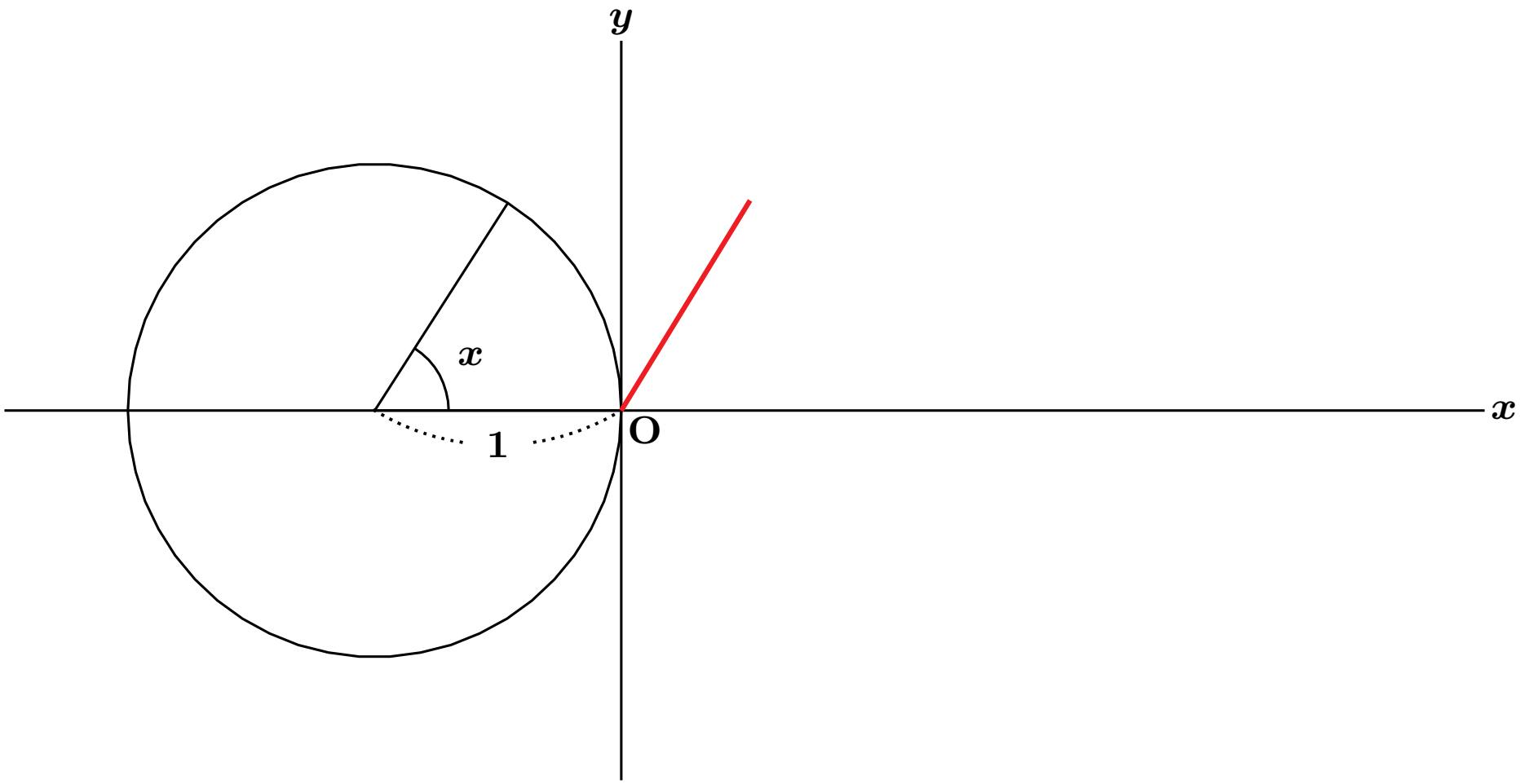
$y = \sin x$ のグラフのかき方



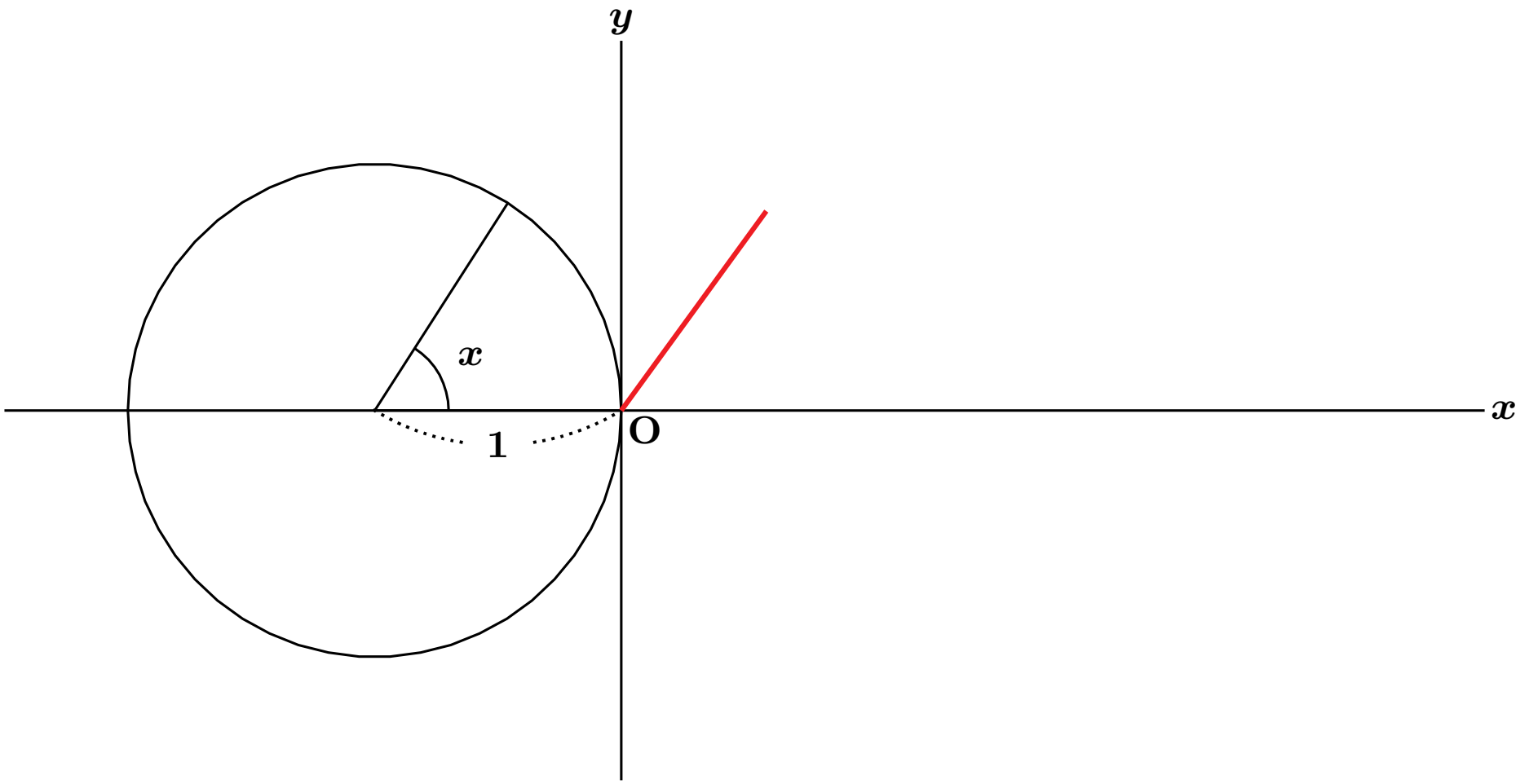
$y = \sin x$ のグラフのかき方



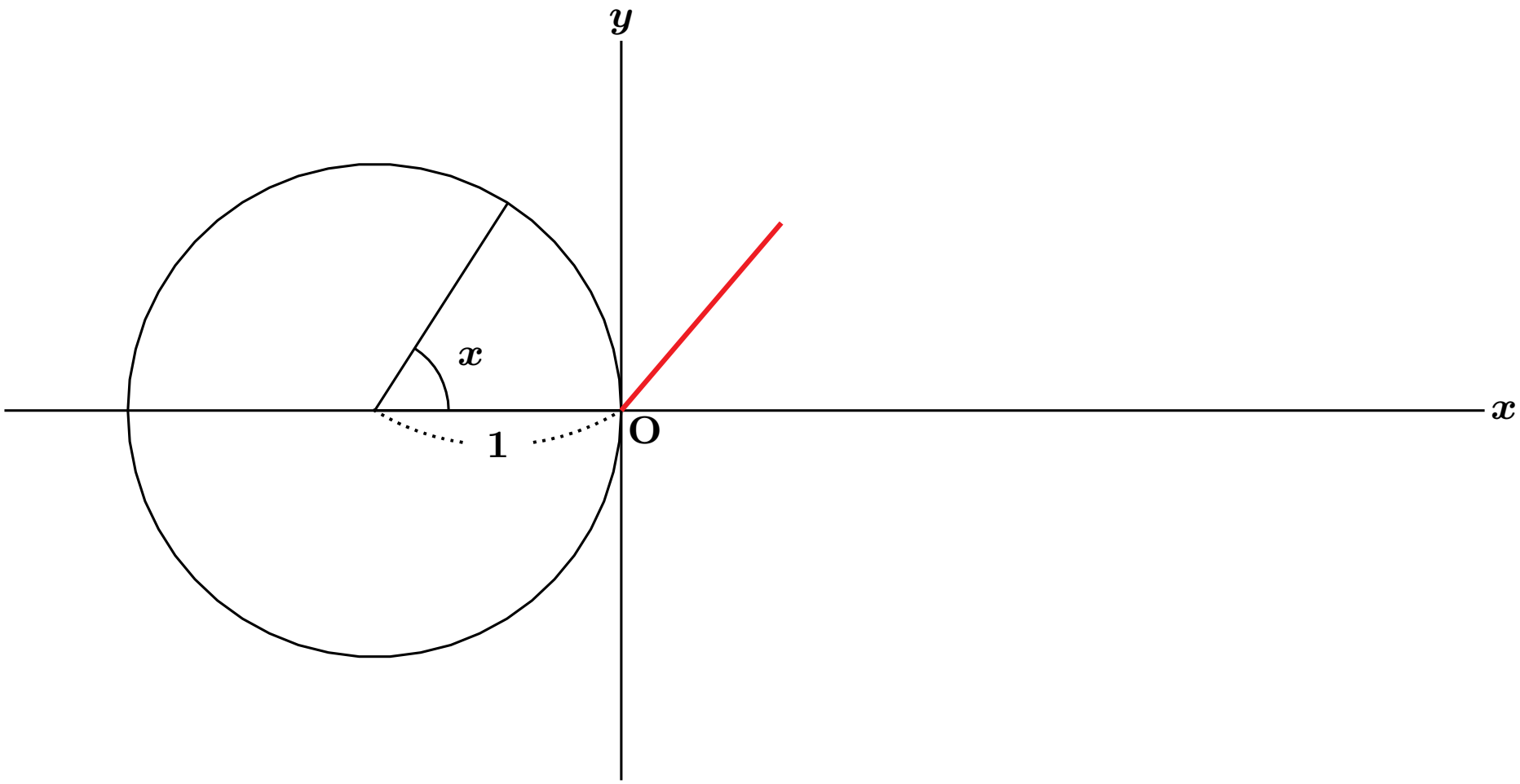
$y = \sin x$ のグラフのかき方



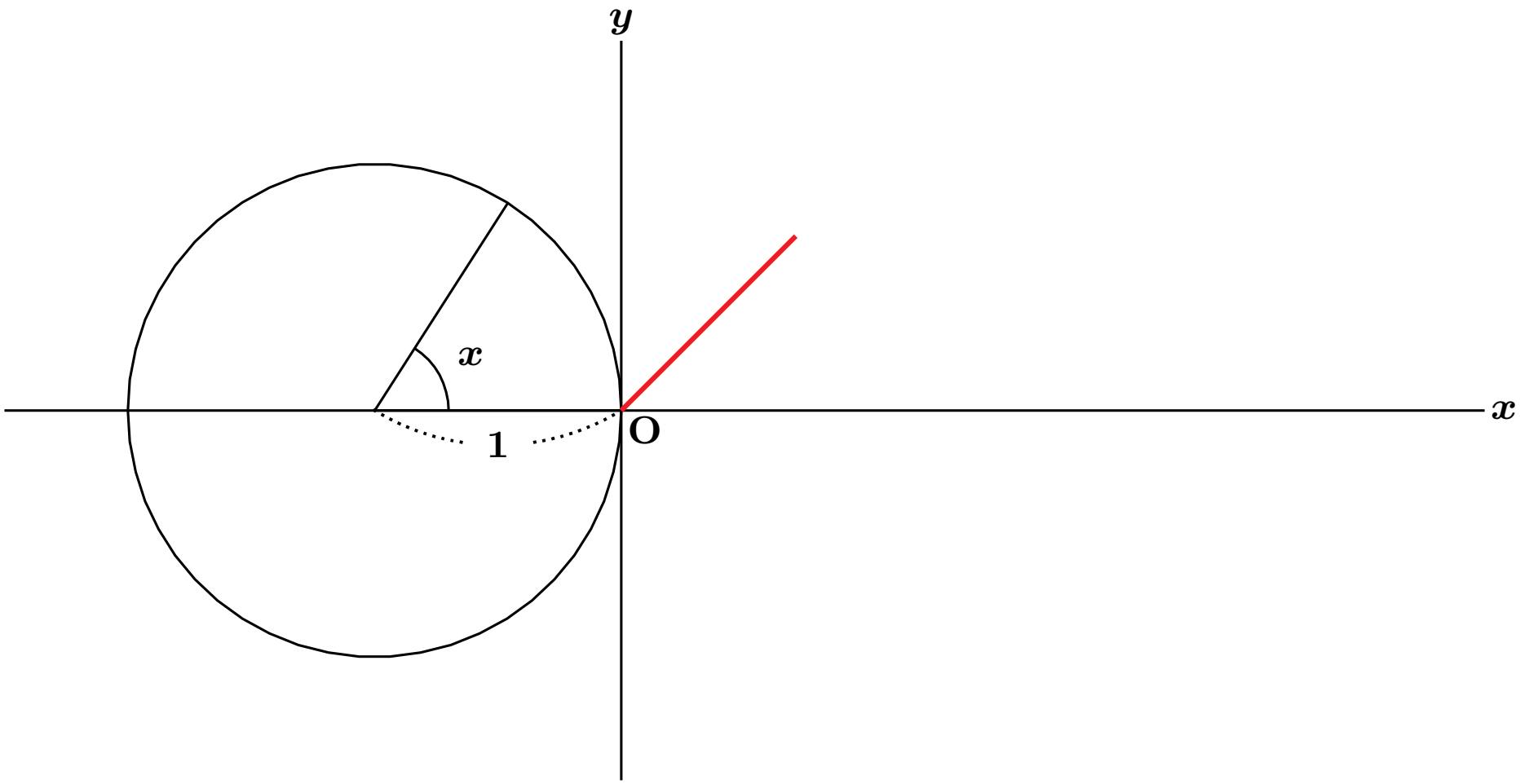
$y = \sin x$ のグラフのかき方



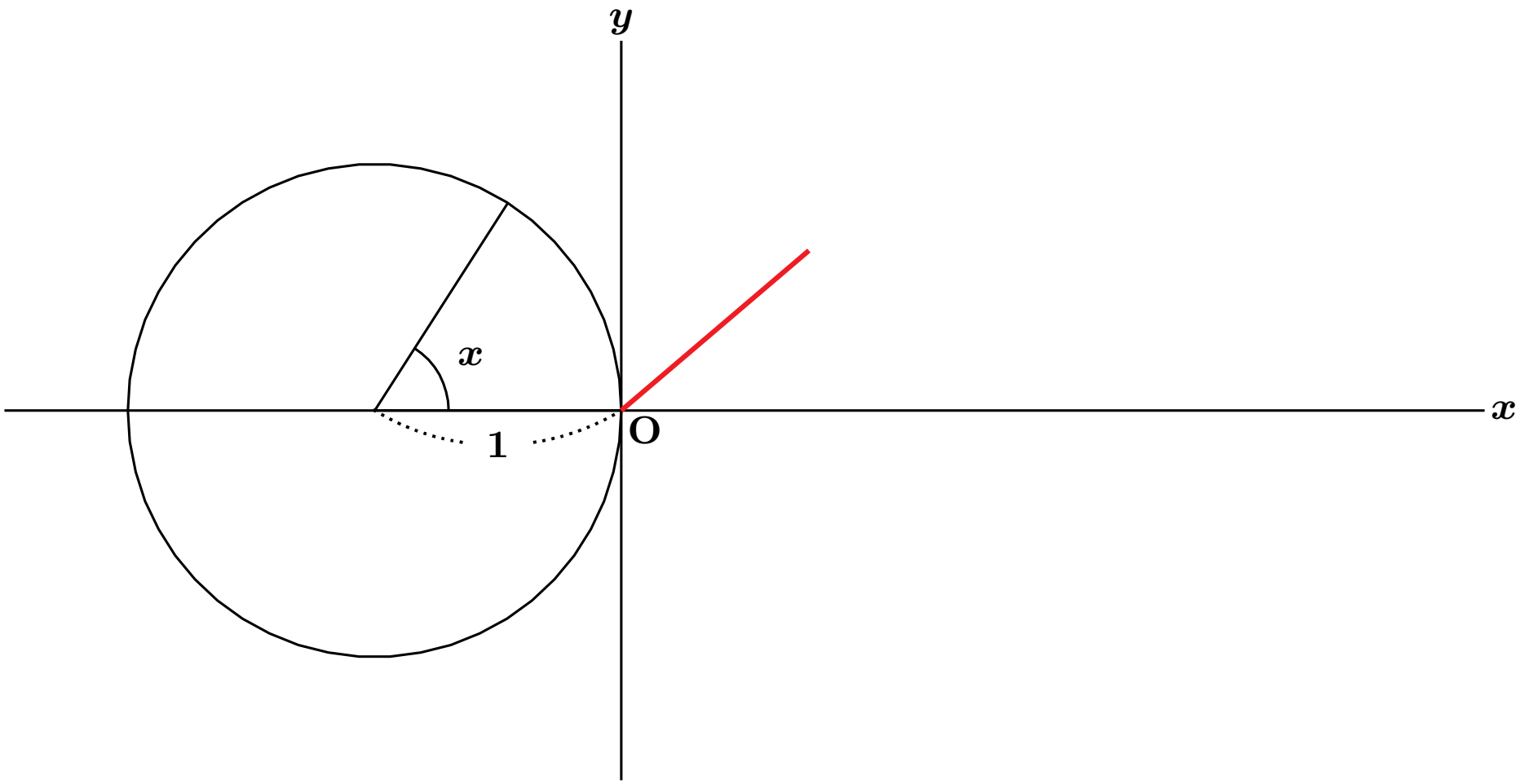
$y = \sin x$ のグラフのかき方



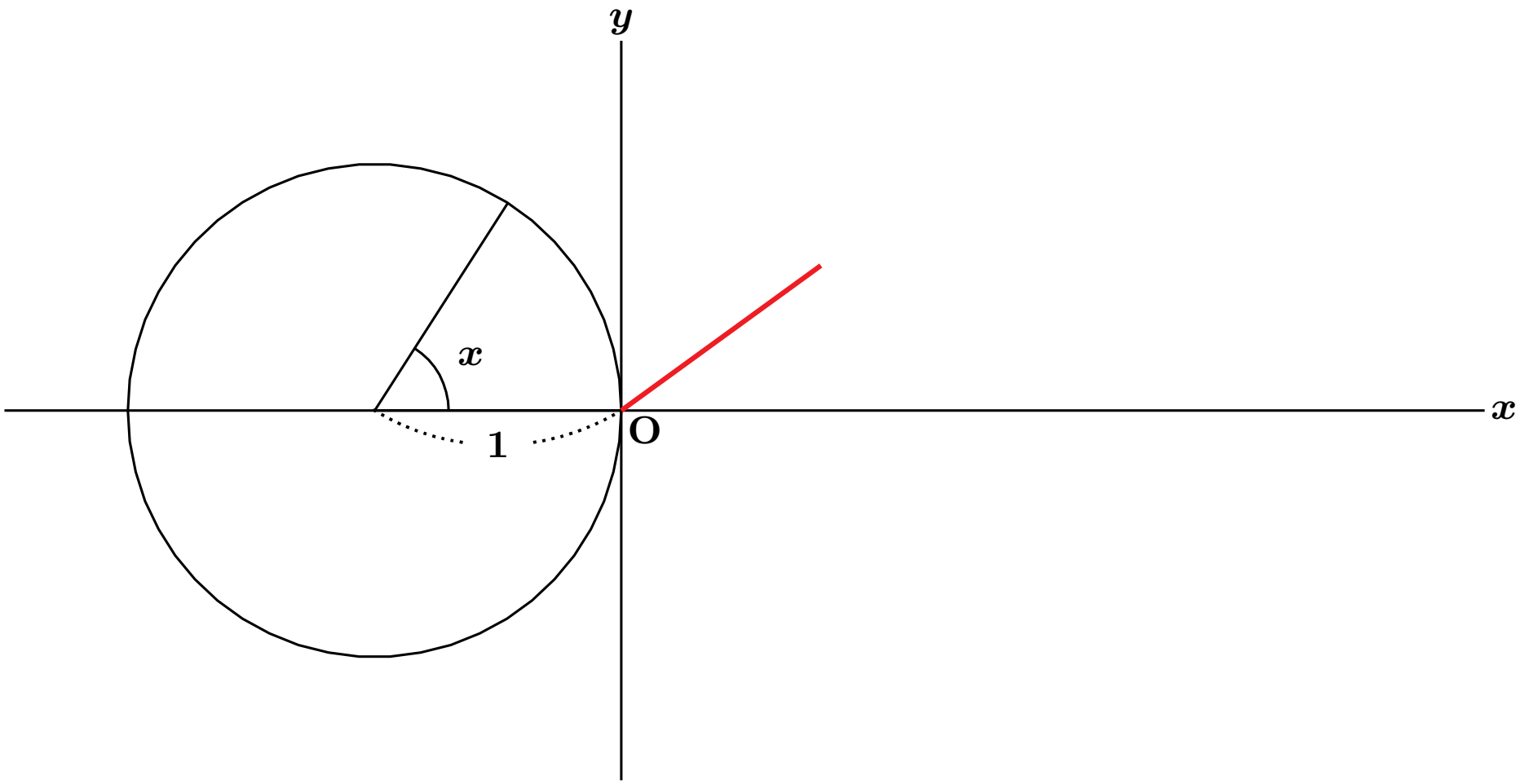
$y = \sin x$ のグラフのかき方



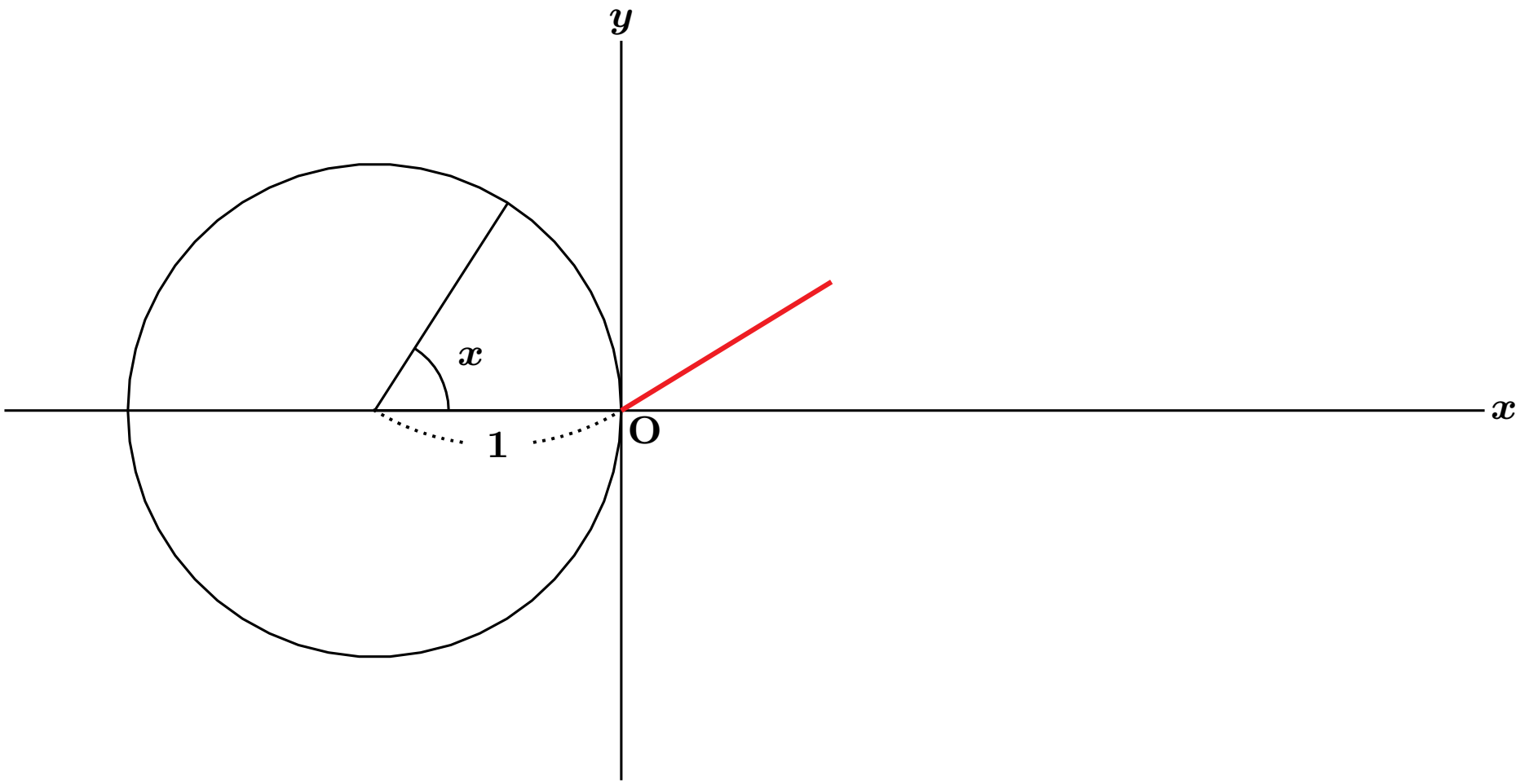
$y = \sin x$ のグラフのかき方



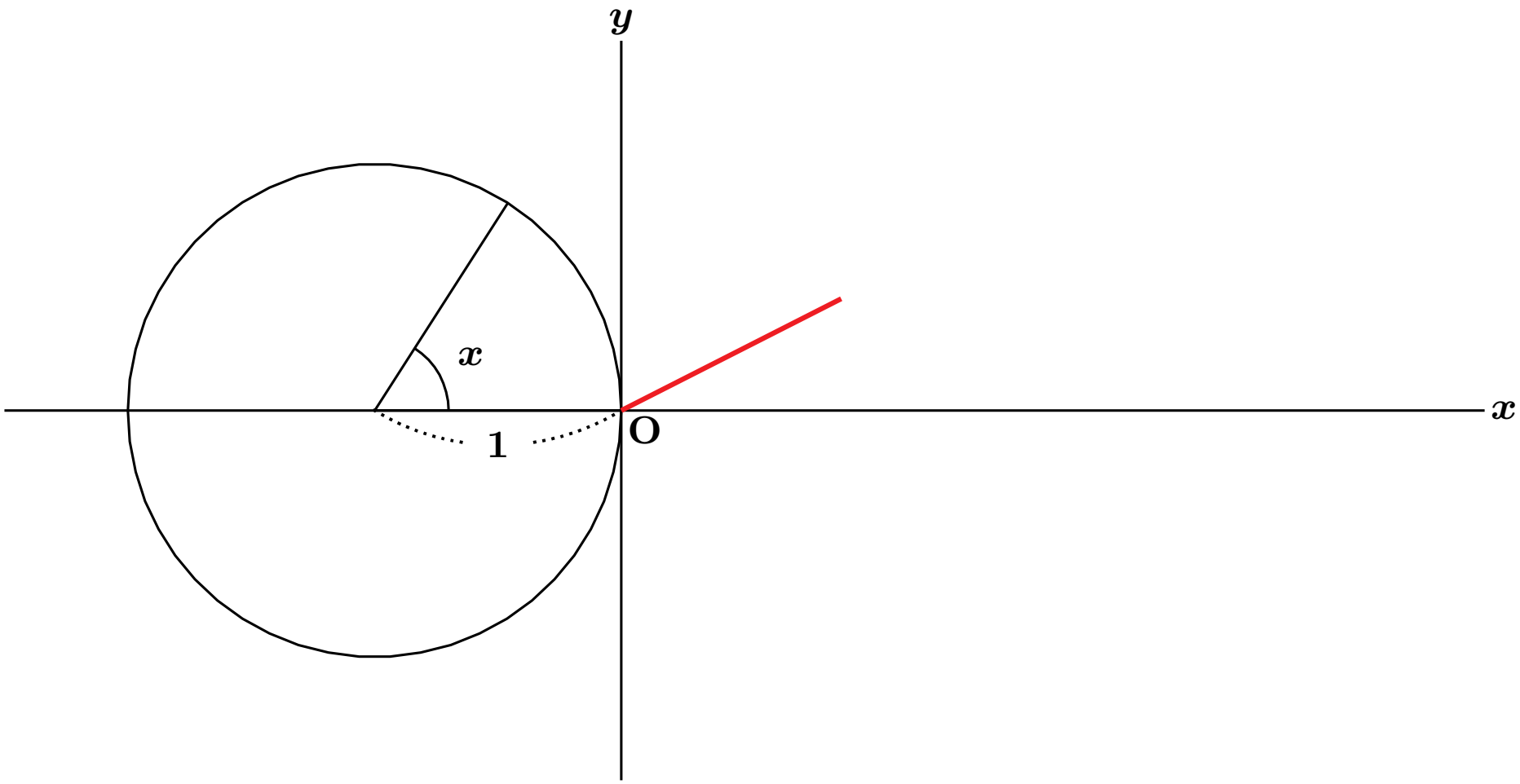
$y = \sin x$ のグラフのかき方



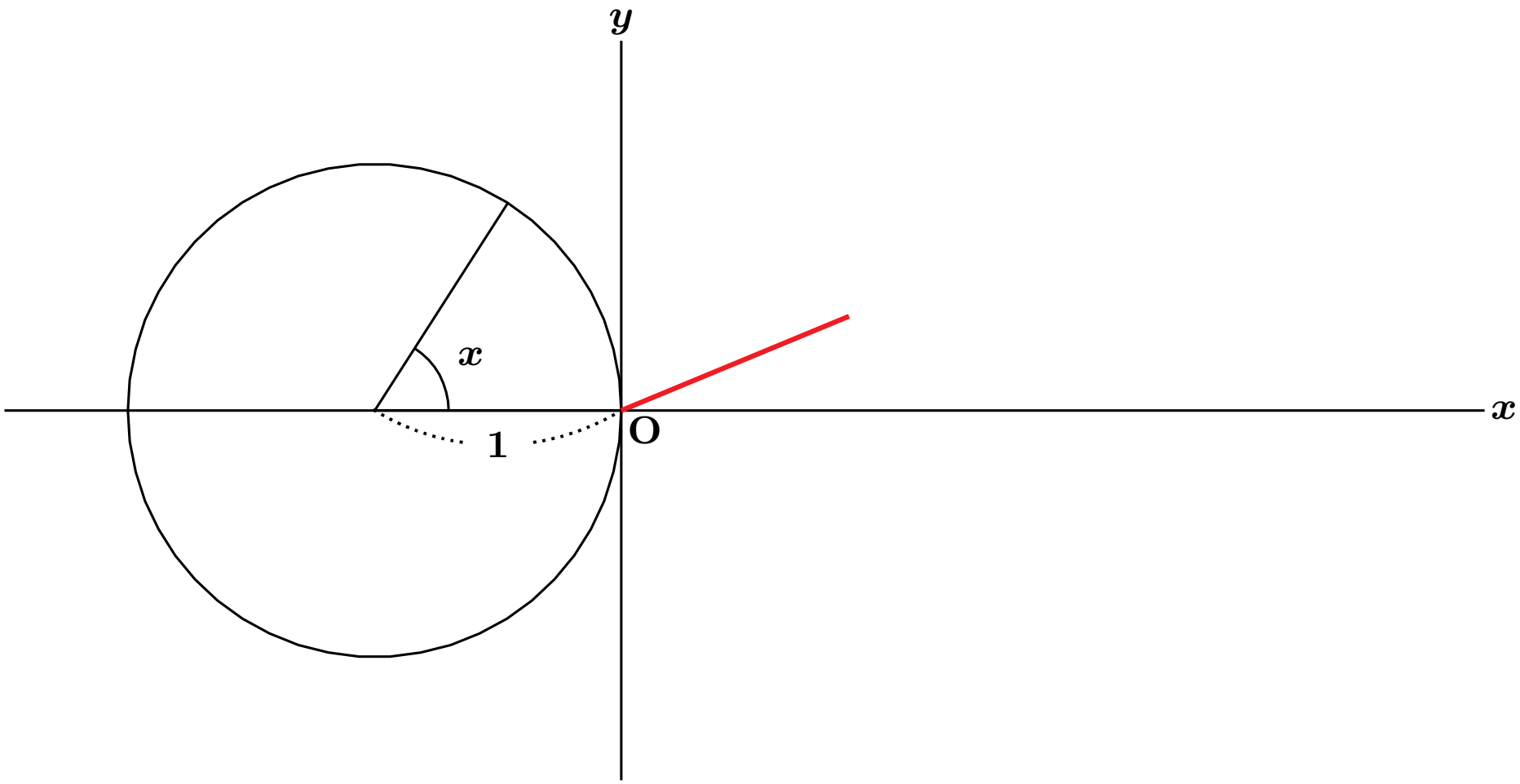
$y = \sin x$ のグラフのかき方



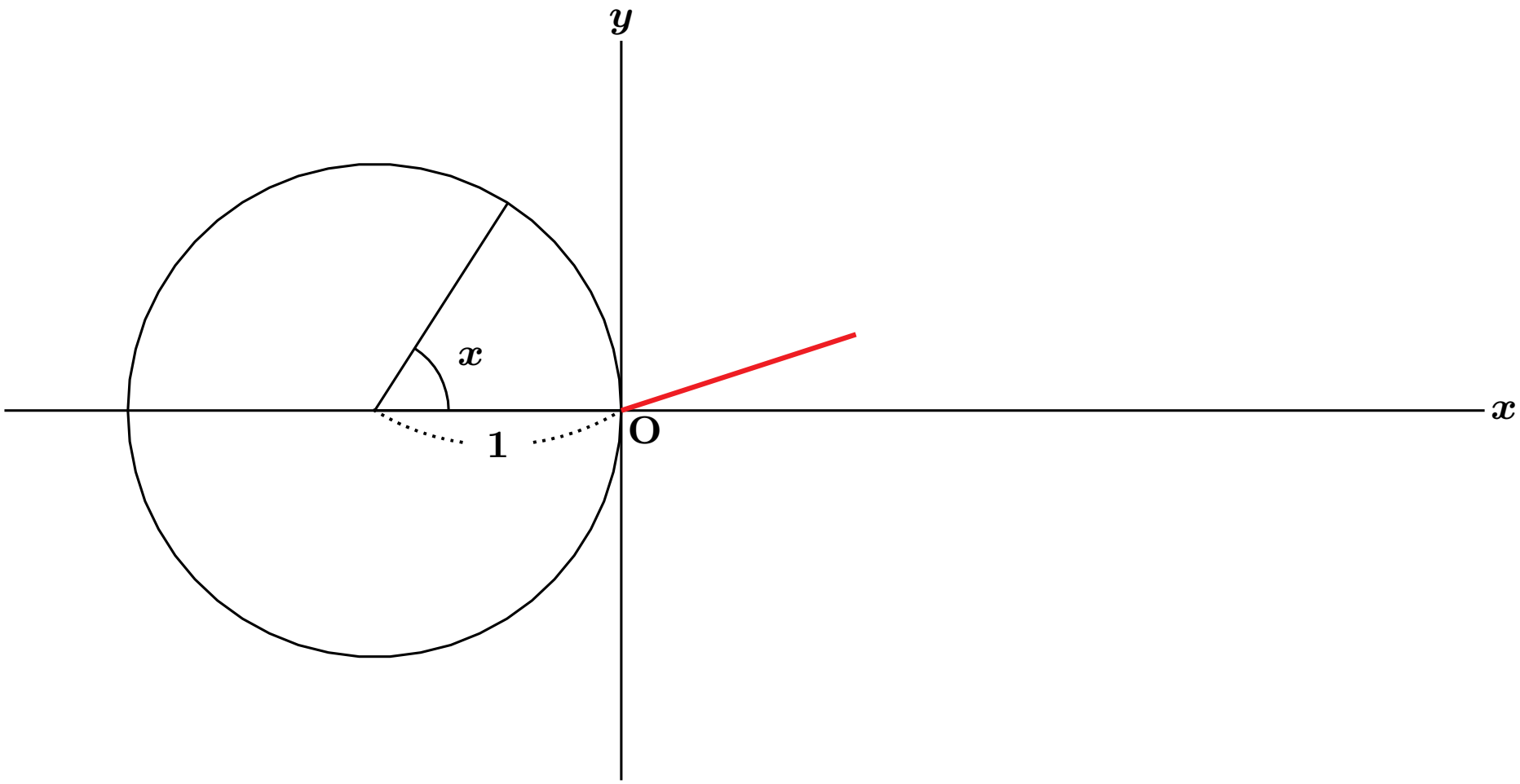
$y = \sin x$ のグラフのかき方



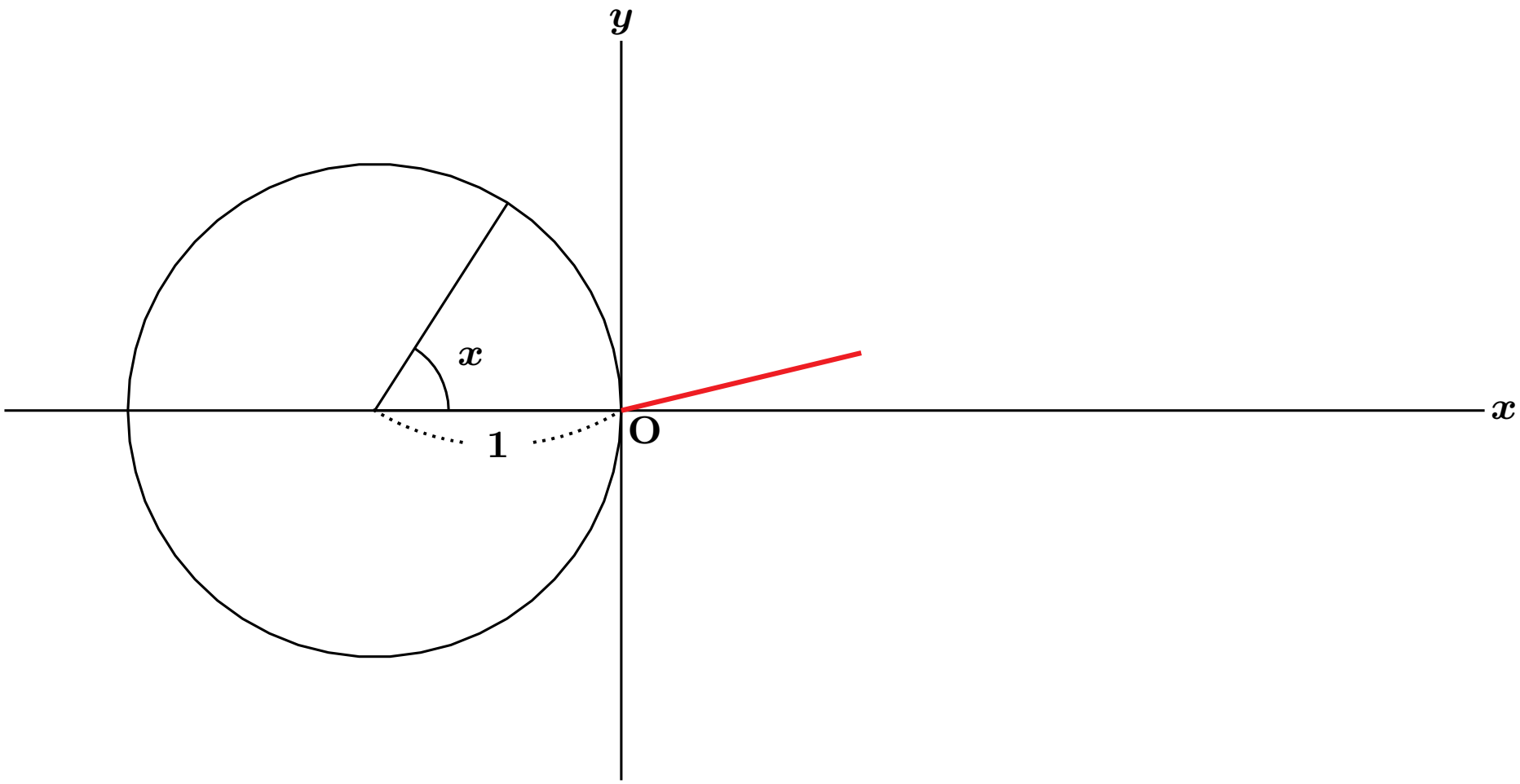
$y = \sin x$ のグラフのかき方



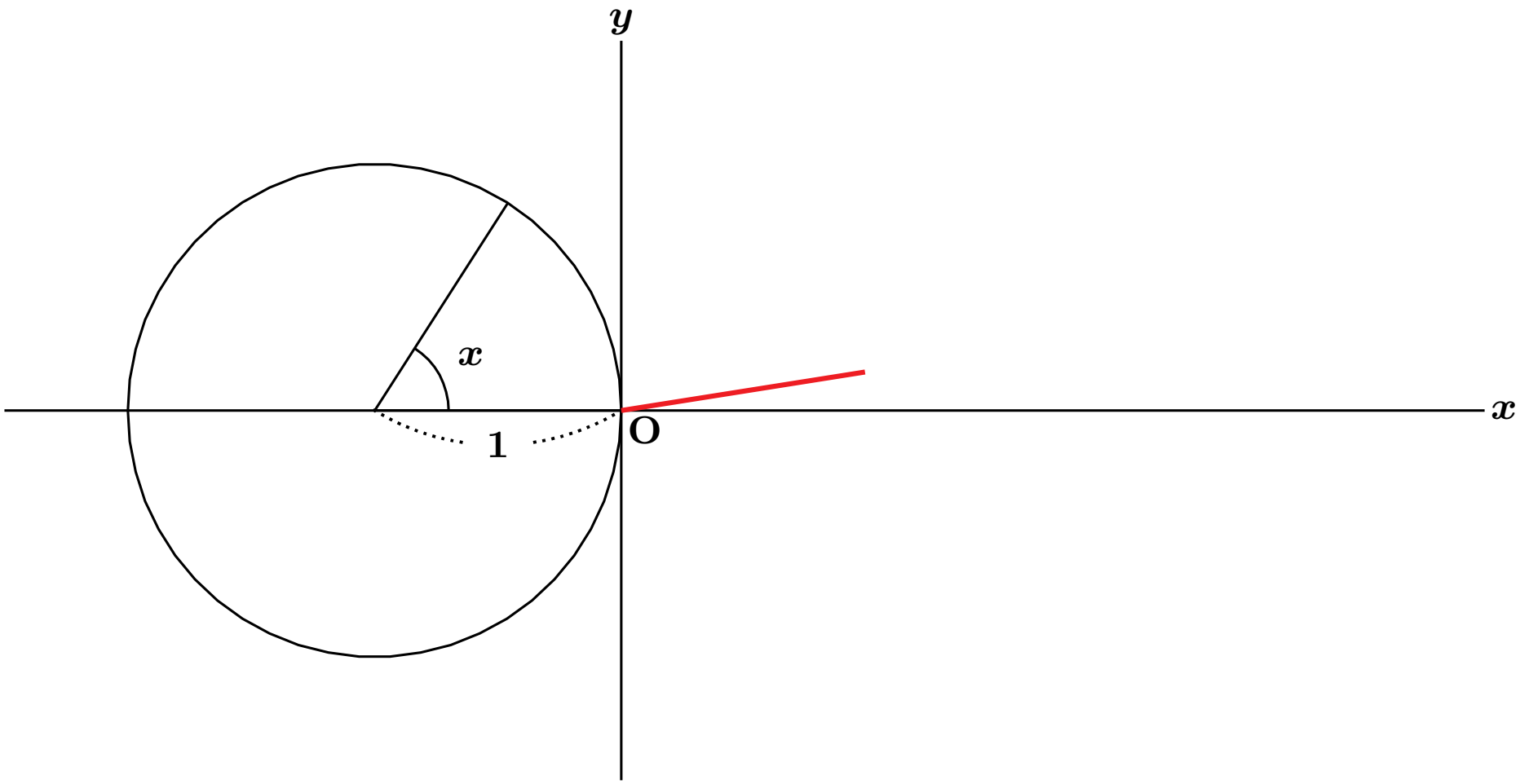
$y = \sin x$ のグラフのかき方



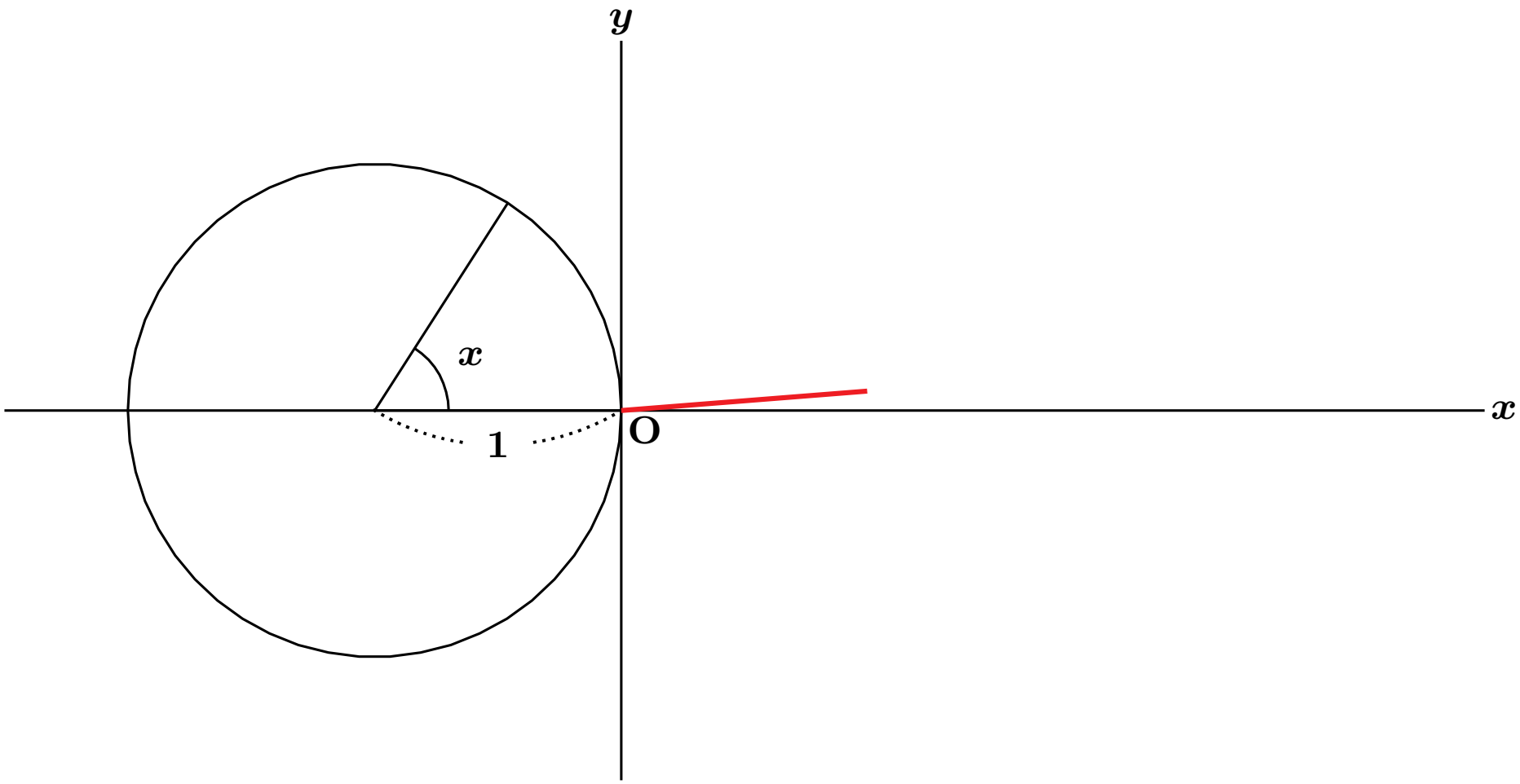
$y = \sin x$ のグラフのかき方



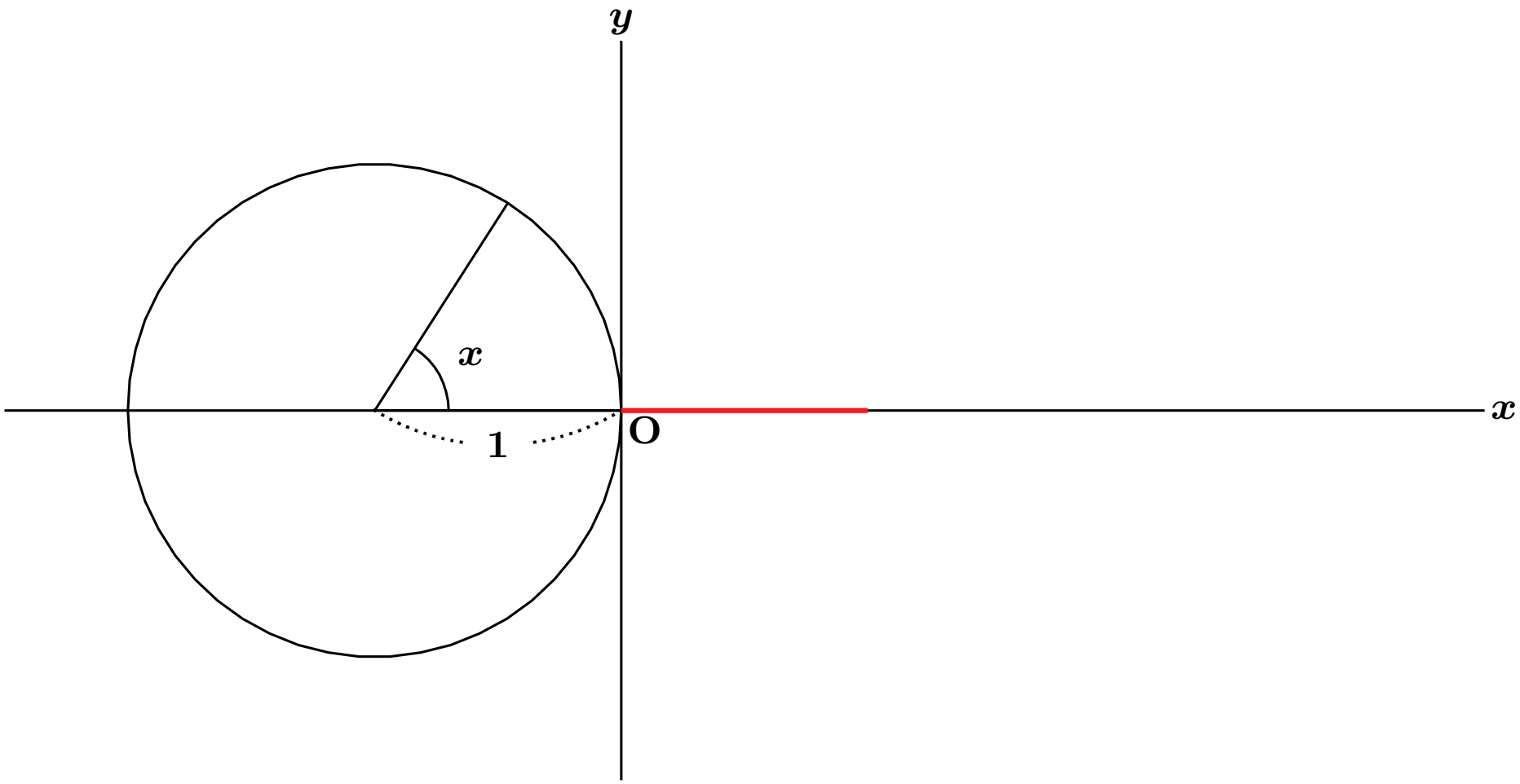
$y = \sin x$ のグラフのかき方



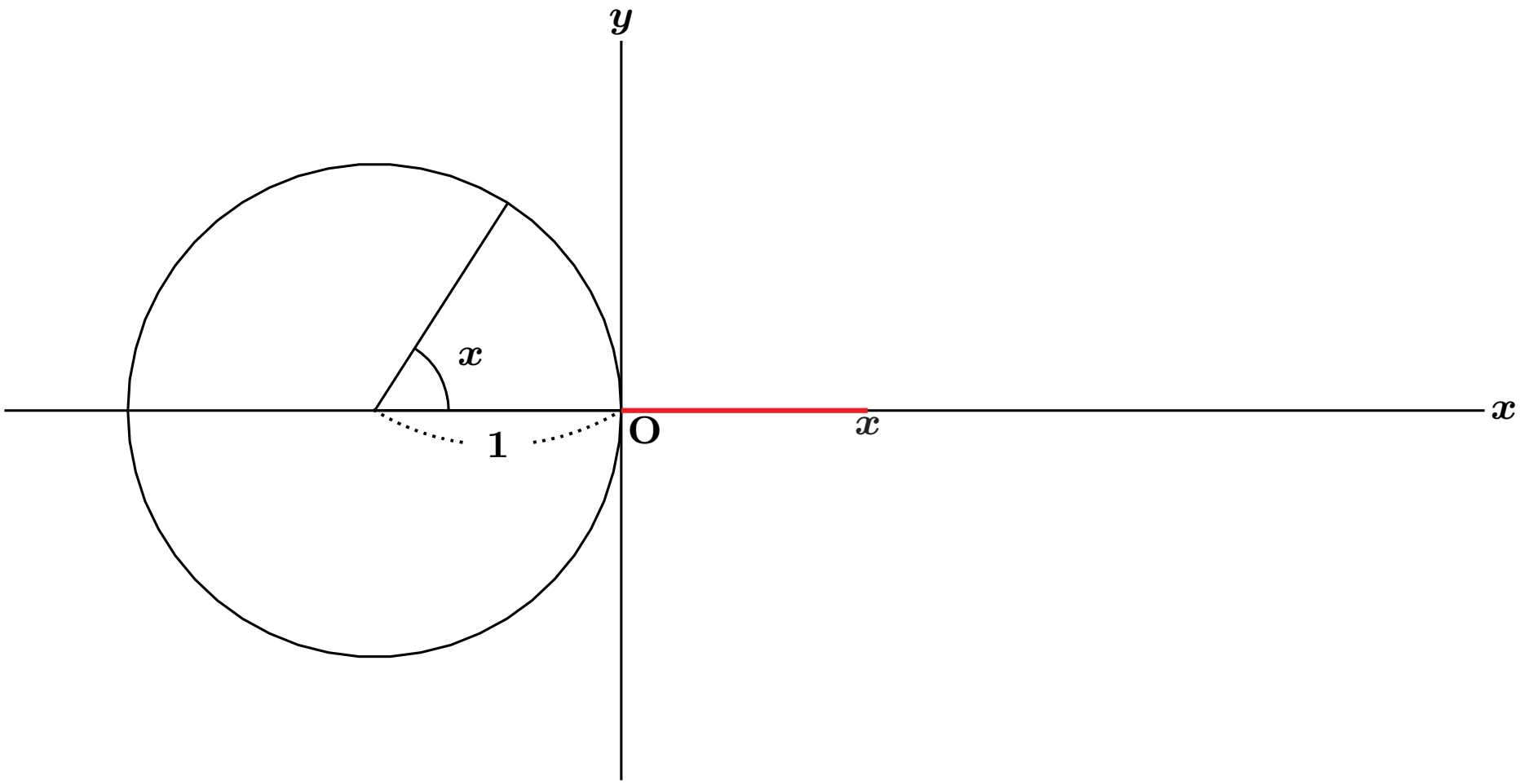
$y = \sin x$ のグラフのかき方



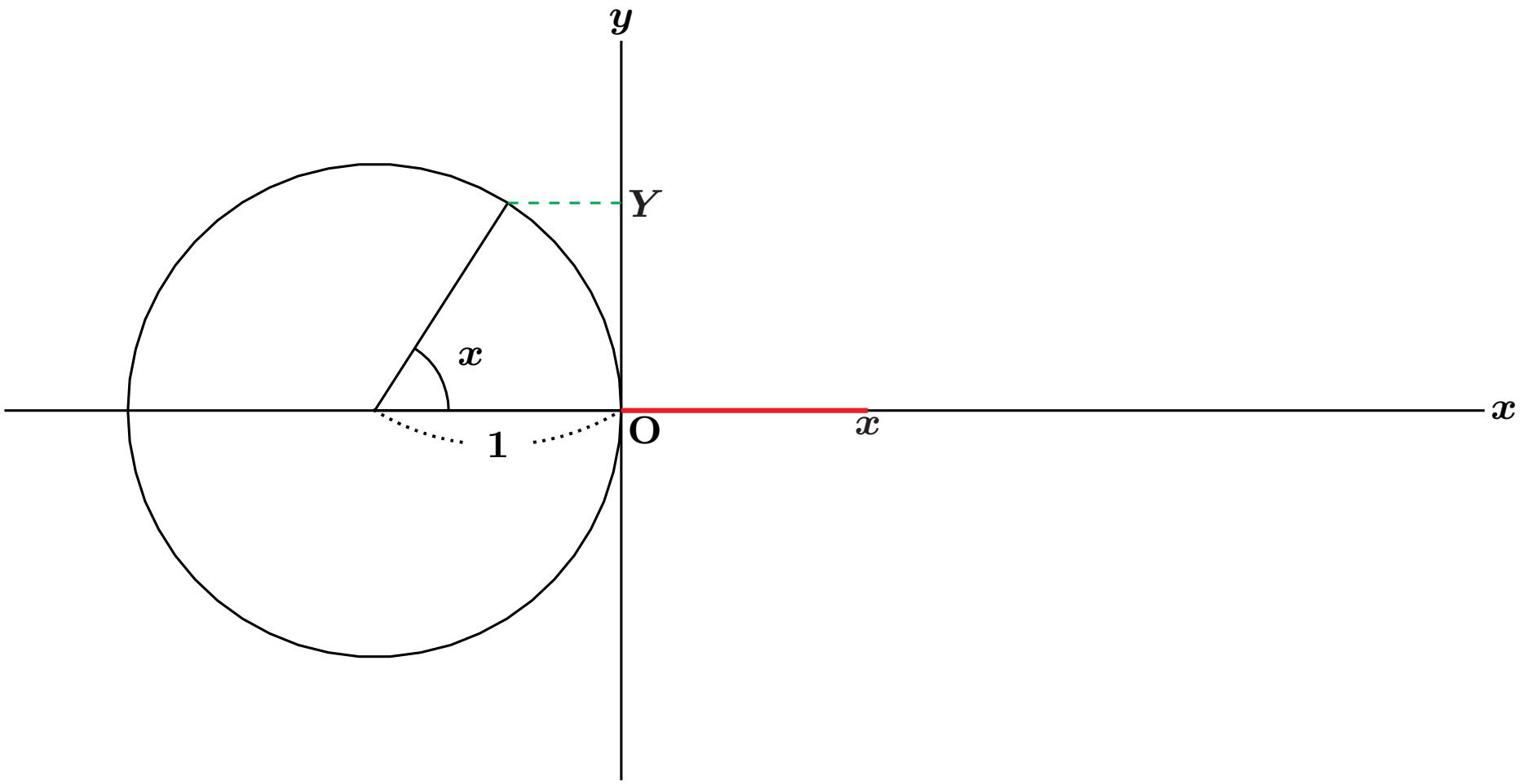
$y = \sin x$ のグラフのかき方



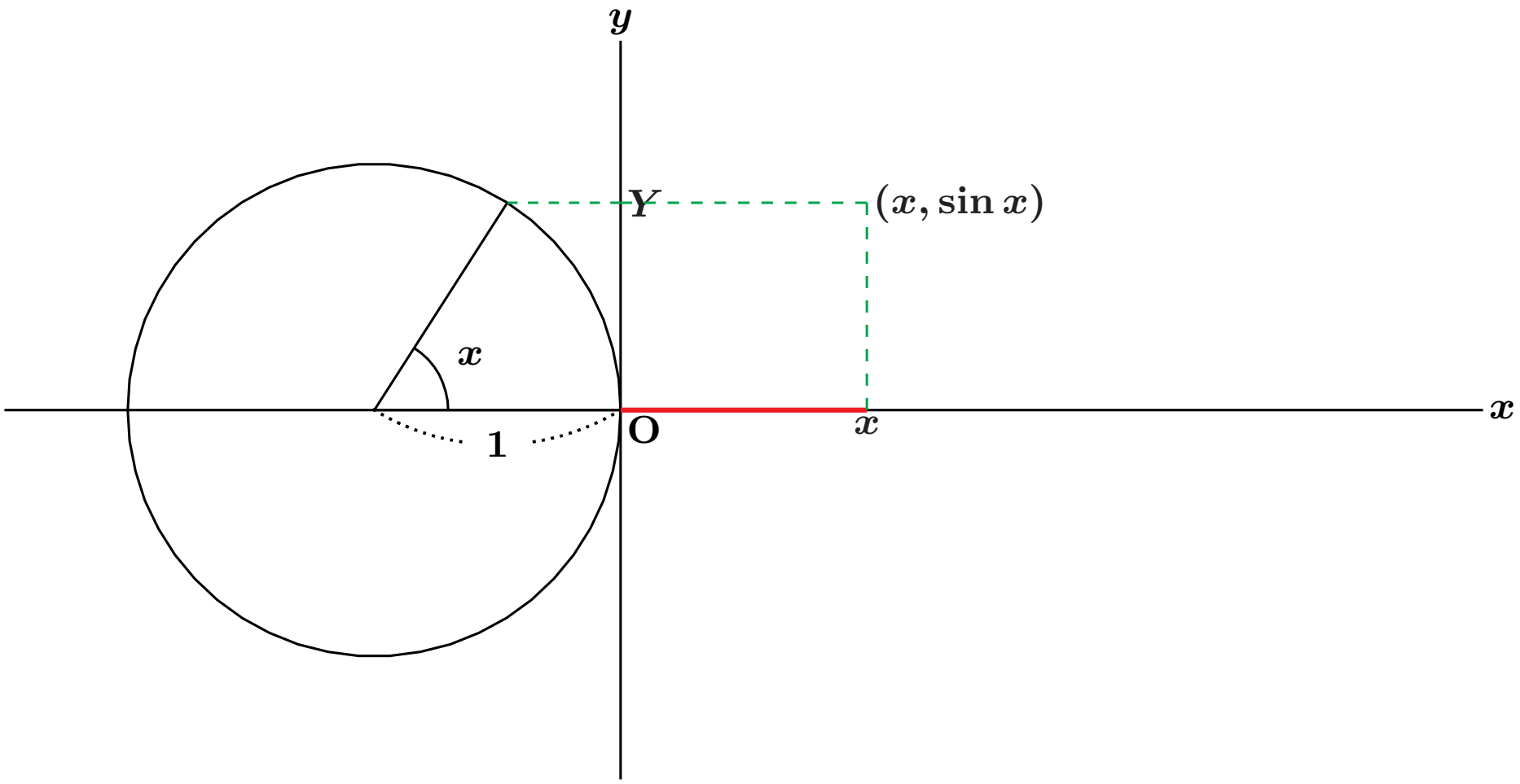
$y = \sin x$ のグラフのかき方



$y = \sin x$ 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）

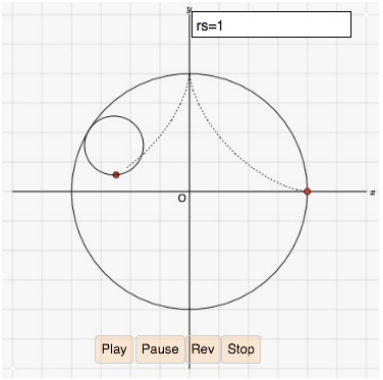
```
cmdL=[
 .....
 "eq3:ev(f=0,[x=x1+u2*t,y=y1+v2*t])",[],
 "ans:solve(eq3,t)",[],
 "u2::v2::tb::x2b::y2b::ta::x2a::y2a",[]
];
CalcbyM("ans",cmdL,[""]);
Ketcindyjsdata(["ans0",ans0,"ans",ans]);//no ketjs off
```

- s0612ellipticalbilliard

Hypotrochoid

- スクリプト（一部）

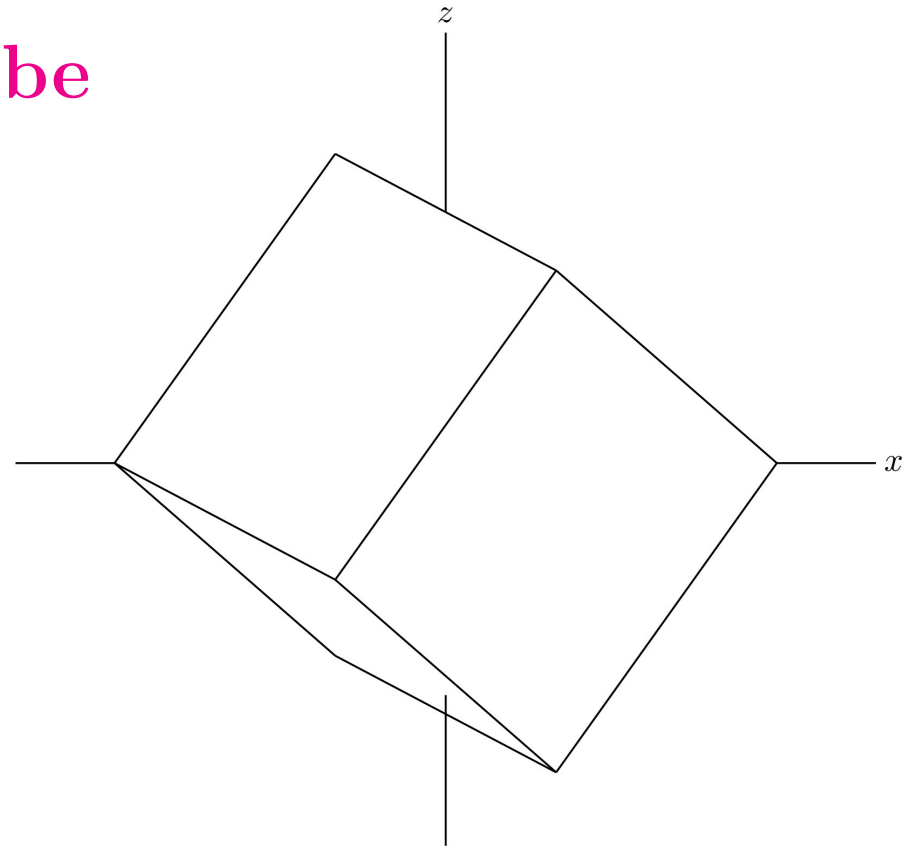
```
Move(pdata,t):=(
  ....
     qt=Rotatepoint(pt,-rad*t/rs,pB);
     tmp=(rad-rs)*[cos(t),sin(t)];
     qt=Translatepoint(qt,tmp-pB);
     qt=Rotatepoint(qt,t,tmp);
....
);
```



- s0607hypotrochoid

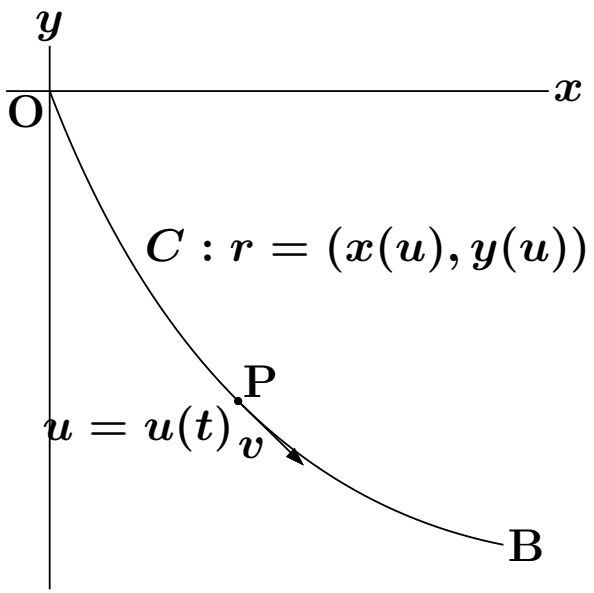
立方体の回転

- s21rotatecube



最速降下曲線

- $\dfrac{du}{dt} = \sqrt{\dfrac{-2gy}{\dot{x}^2 + \dot{y}^2}},\ u(0) = 0$
- $T = \displaystyle\int_0^U \sqrt{\frac{\dot{x}^2 + \dot{y}^2}{-2gy}}\,du$
- s1611brachistchrone

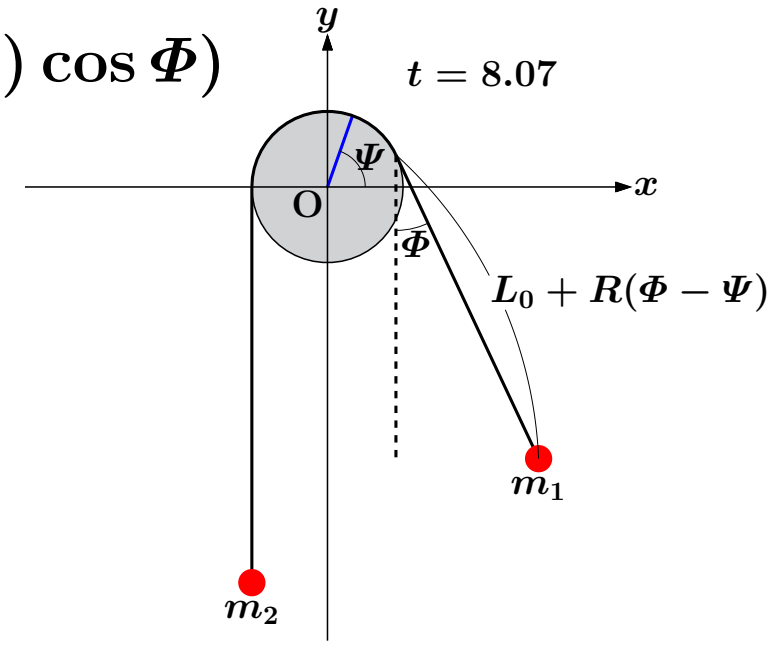


Swinging Atwood's machine

- $\mathcal{L} =$

$$\frac{1}{2}m_1(L_0 + R(\Phi - \Psi))^2\dot{\Phi}^2$$
$$+ \frac{1}{2}(I_0 + (m_1 + m_2)R^2)\dot{\Psi}^2$$
$$- m_1 g(R\sin\Phi - (L_0 + R(\Phi - \Psi))\cos\Phi)$$
$$+ m_2 g R\Psi$$

- s1614atwood



まとめと課題

- KETCindyJS 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ル化することで可能？（北本さんの javacript パッケージを利用）

今日の資料（再掲）