Unit Circle

$$x^2 + y^2 = 1$$

Quadrant II

Quadrant I

$P(x,y)$

R

ℓ

s

1

θ

-1

O

Q

1

T

x

s*

-1

Quadrant III

Quadrant IV
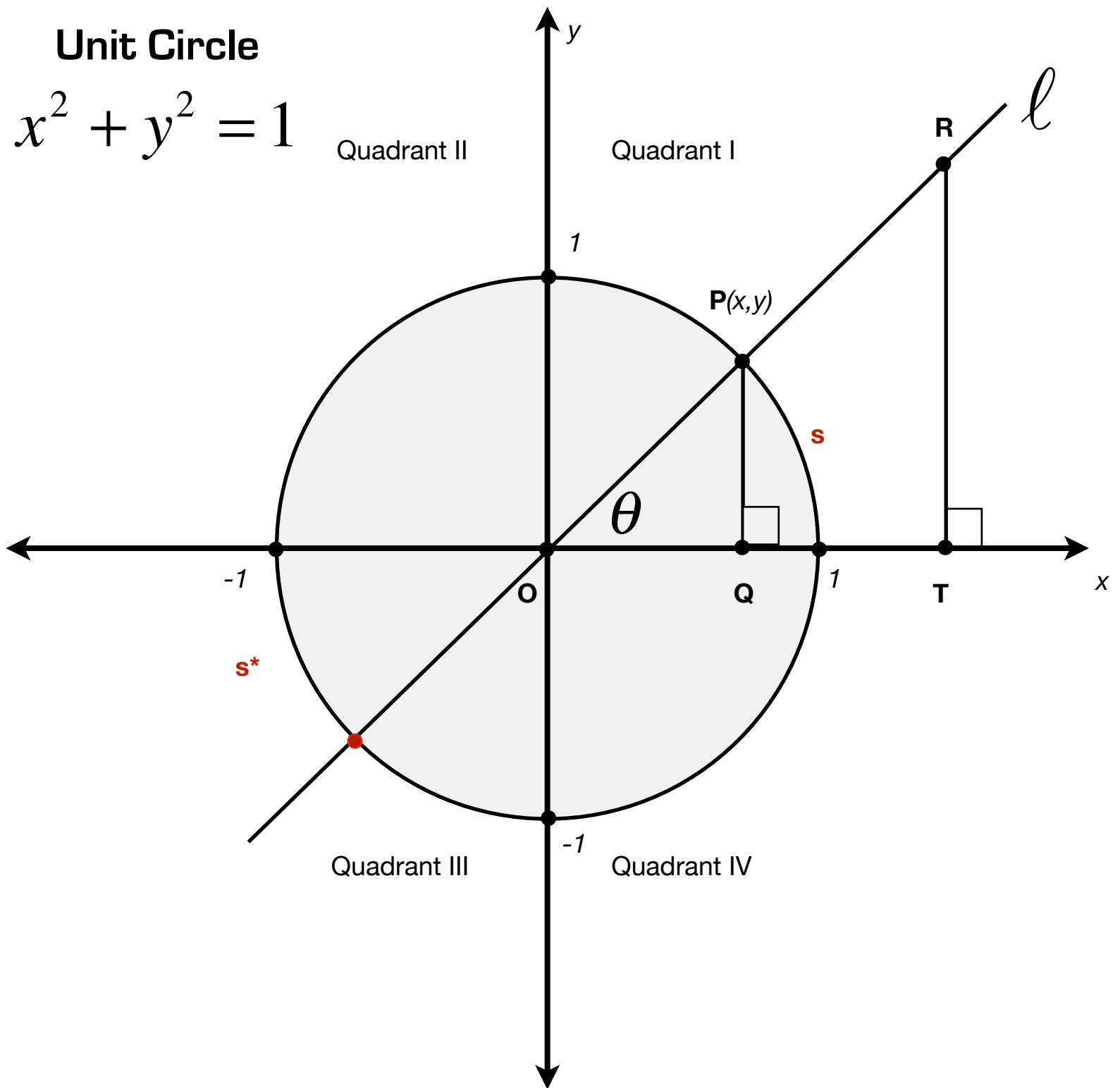
Circular Functions

$$\sin(\theta) = \sin(s) = \frac{\overline{RT}}{\overline{OR}} = \frac{y}{1} = y$$

$$\cos(\theta) = \cos(s) = \frac{\overline{OT}}{\overline{OR}} = \frac{x}{1} = x$$

$$\tan(\theta) = \tan(s) = \frac{\overline{RT}}{\overline{OT}} = \frac{y}{x}, x \neq 0$$

Unit Circle

$$x^2 + y^2 = 1$$

$$y = \frac{1}{\sqrt{3}}x$$

$$y = -\frac{1}{\sqrt{3}}x$$

Quadrant II

Quadrant I

Quadrant III

Quadrant IV

P(x,y)

R

s*

s

s*

s*

θ

Q

T

1

-1

1

-1

x

y

θ	s	x	y	sin(s)	cos(s)	tan(s)	csc(s)	sec(s)	cot(s)
30									
150									
210									
330									

Unit Circle

$$x^2 + y^2 = 1$$

θ	s	x	y	sin(s)	cos(s)	tan(s)	csc(s)	sec(s)	cot(s)
45									
135									
225									
315									

Unit Circle

$$x^2 + y^2 = 1$$

θ	s	x	y	sin(s)	cos(s)	tan(s)	csc(s)	sec(s)	cot(s)
60									
120									
240									
300									

Unit Circle Summary

θ	s	x	y	sin(s)	cos(s)	tan(s)	csc(s)	sec(s)	cot(s)
0									
30									
45									
60									
90									
120									
135									
150									
180									
210									
225									
240									
270									
300									
315									
330									
360									