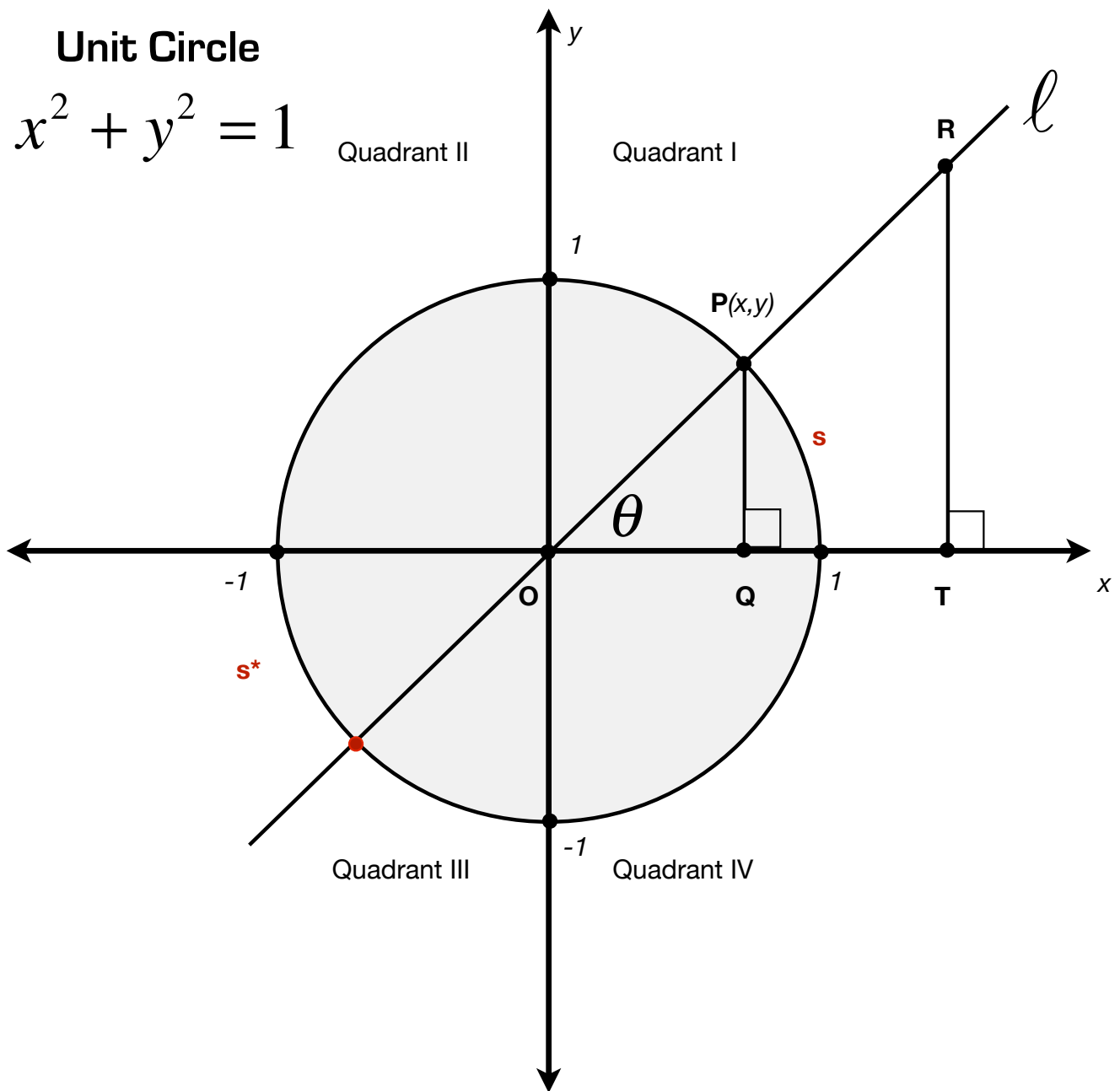




Circular Functions

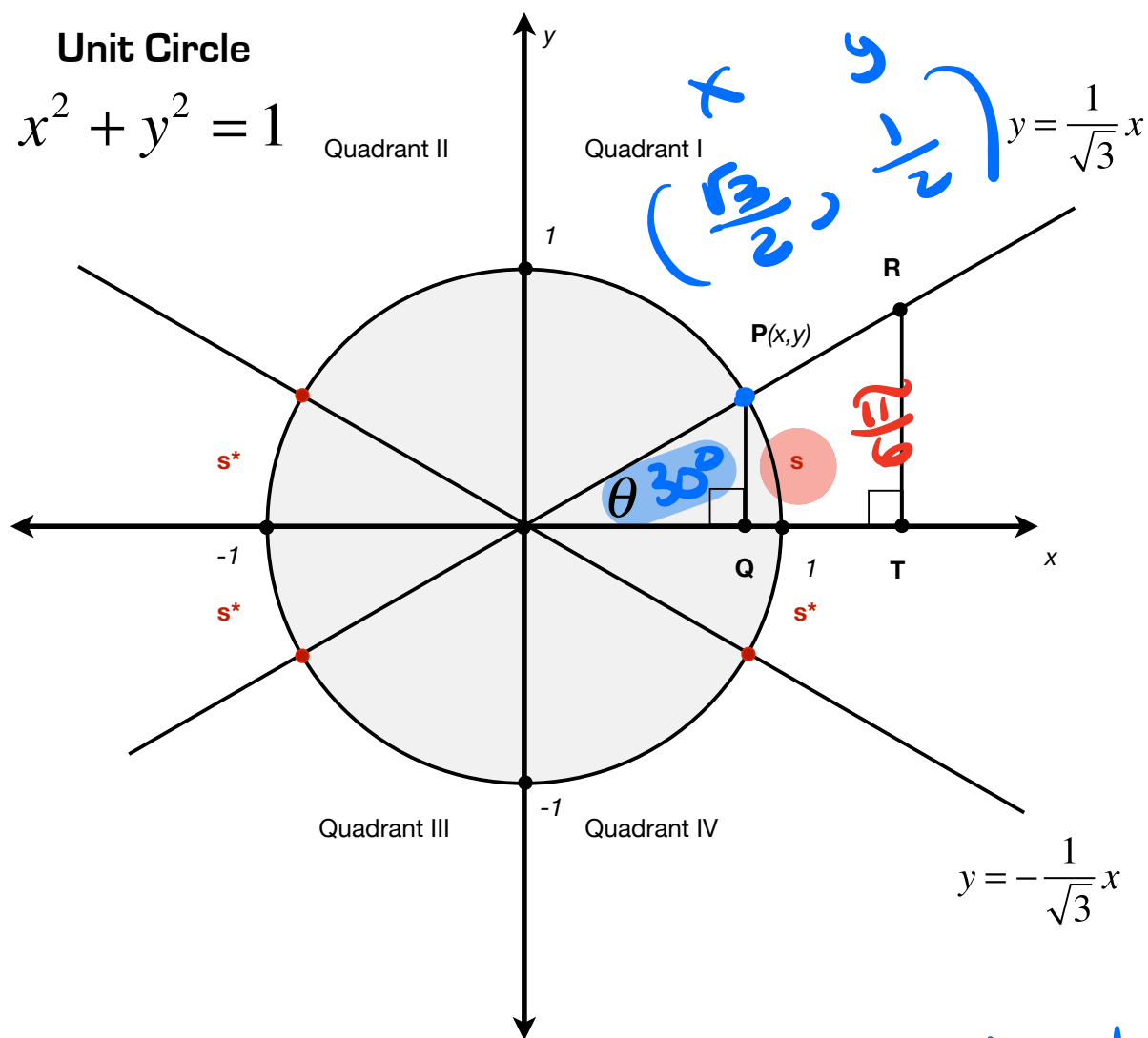
$$\sin(\theta) = \sin(s) = \frac{\overline{RT}}{\overline{OR}} = \frac{y}{1} = y$$

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

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

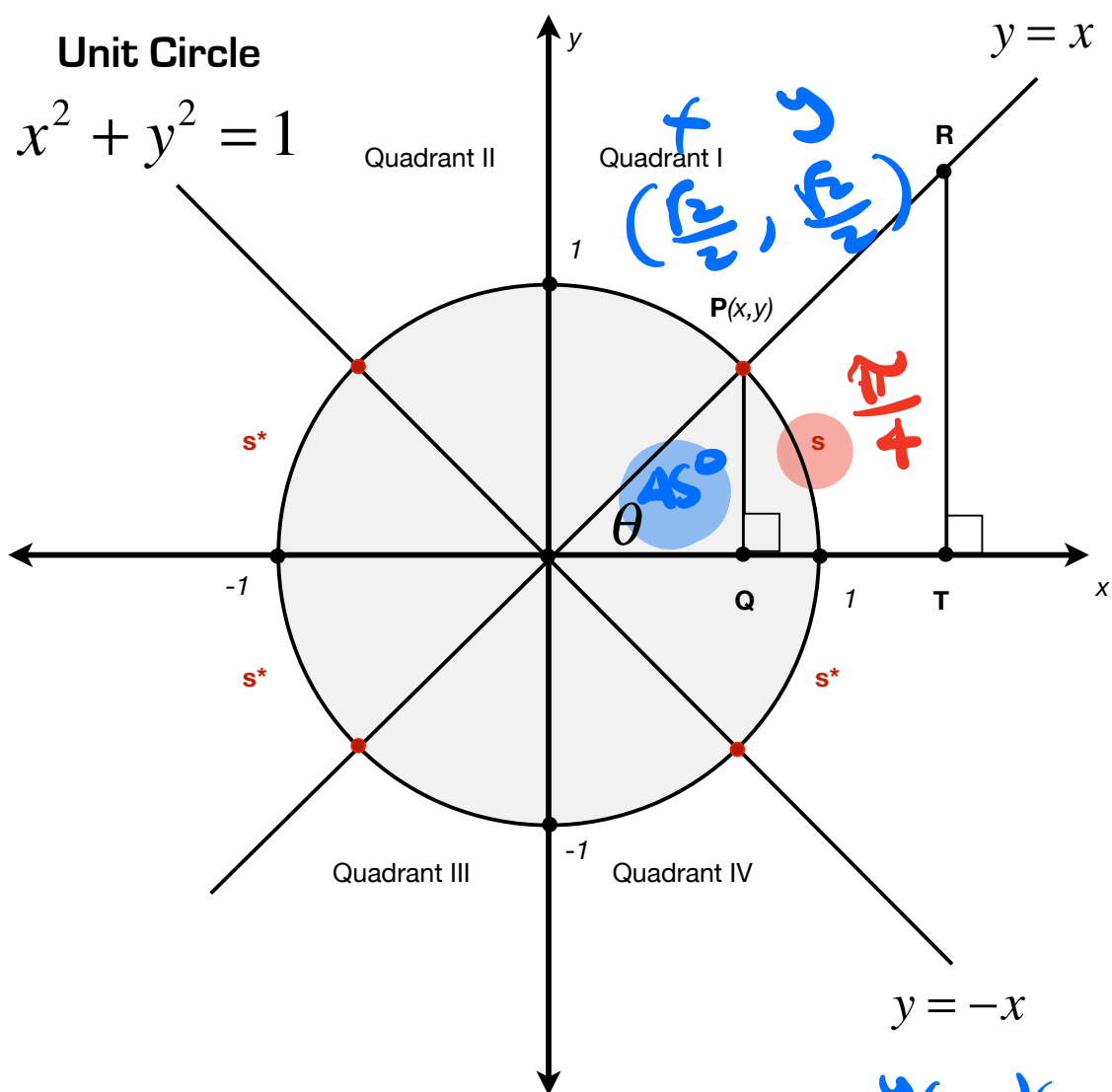
Unit Circle

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

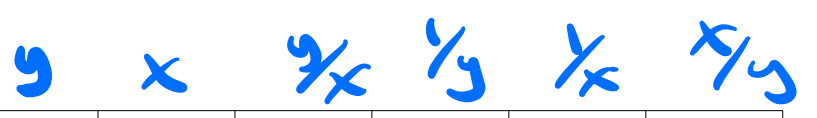


y x y/x $1/y$ $1/x$ x/y

θ	s	x	y	$\sin[s]$	$\cos[s]$	$\tan[s]$	$\csc[s]$	$\sec[s]$	$\cot[s]$
30	$\pi/6$	$\sqrt{3}/2$	$1/2$	$1/2$	$\sqrt{3}/2$	$\sqrt{3}/3$	2	$2\sqrt{3}/3$	$\sqrt{3}$
150	$5\pi/6$	$-\sqrt{3}/2$	$1/2$	$1/2$	$-\sqrt{3}/2$	$-\sqrt{3}/3$	2	$-2\sqrt{3}/3$	$-\sqrt{3}$
210	$7\pi/6$	$-\sqrt{3}/2$	$-1/2$	$-1/2$	$-\sqrt{3}/2$	$\sqrt{3}/3$	-2	$-2\sqrt{3}/3$	$\sqrt{3}$
330	$11\pi/6$	$\sqrt{3}/2$	$-1/2$	$-1/2$	$\sqrt{3}/2$	$-\sqrt{3}/3$	-2	$2\sqrt{3}/3$	$-\sqrt{3}$



θ	s	x	y	$\sin[s]$	$\cos[s]$	$\tan[s]$	$\csc[s]$	$\sec[s]$	$\cot[s]$
45	$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1	$\sqrt{2}$	$\sqrt{2}$	1
135	$\frac{3\pi}{4}$	$-\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	-1	$\sqrt{2}$	$-\sqrt{2}$	-1
225	$\frac{5\pi}{4}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	1	$-\sqrt{2}$	$-\sqrt{2}$	1
315	$\frac{7\pi}{4}$	$\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	-1	$-\sqrt{2}$	$\sqrt{2}$	-1

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


θ	s	x	y	$\sin[s]$	$\cos[s]$	$\tan[s]$	$\csc[s]$	$\sec[s]$	$\cot[s]$
60	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$	$\frac{2\sqrt{3}}{3}$	2	$\frac{\sqrt{3}}{3}$
120	$\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$-\sqrt{3}$	$-\frac{2\sqrt{3}}{3}$	-2	$-\frac{\sqrt{3}}{3}$
240	$-\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$\sqrt{3}$	$-\frac{2\sqrt{3}}{3}$	-2	$\frac{\sqrt{3}}{3}$
300	$-\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$-\sqrt{3}$	$-\frac{2\sqrt{3}}{3}$	2	$-\frac{\sqrt{3}}{3}$

Unit Circle Summary

x y $\frac{y}{x}$ $\frac{1}{x}$ $\frac{1}{y}$ $\frac{x}{y}$

θ	s	x	y	sin[s]	cos[s]	tan[s]	csc[s]	sec[s]	cot[s]
0	0	1	0	1	0	0	1	und	und
30									
45		See above							
60									
90	$\frac{\pi}{2}$	0	1	0	1	und	und	1	0
120									
135		See above							
150									
180	π	-1	0	-1	0	0	-1	und	und
210									
225		See above							
240									
270	$\frac{3\pi}{2}$	0	-1	0	-1	und	und	-1	0
300									
315		See above							
330									
360	2π	1	0	1	0	0	1	und	und