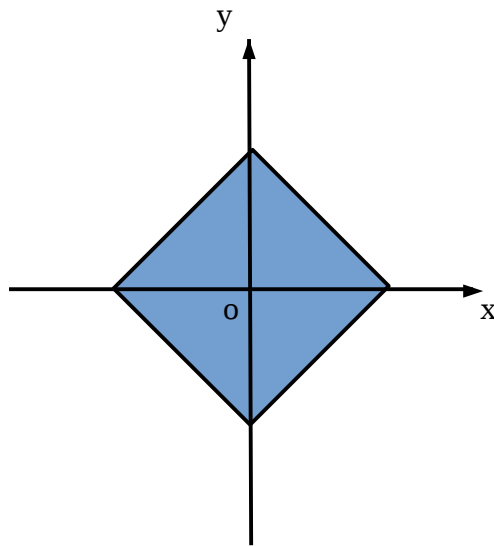


Absolute Value Functions



(1) $|x| + |y| \leq 1$ is the inequality of the region shaded blue. Determine the equations of the quadrants I, II, III, and IV boundaries.

Ans(1) The boundary of the region has equation $|x| + |y| = 1$.

So, in quadrant I, the boundary equation is $x + y = 1$

In quadrant II, the boundary equation is $-x + y = 1$

In quadrant III, the boundary equation is $-x - y = 1$

In quadrant IV, the boundary equation is $x - y = 1$

(2) Find $|\sin \theta|$ $[-\pi/2, \pi/2]$

Ans (2) $\sin \theta$ $[0, \pi/2]$

$$|\sin \theta| = \begin{cases} \sin \theta & [0, \pi/2] \\ -\sin \theta & (0, -\pi/2] \end{cases}$$

(3) Find $|\cos \theta|$ $[-\pi/2, \pi/2]$

Ans (3) $\cos \theta$ $[0, \pi/2]$

$$|\cos \theta| = \begin{cases} \cos \theta & [0, \pi/2] \\ \cos \theta & (0, -\pi/2] \end{cases}$$