

# The Weekly Rigor

No. 257

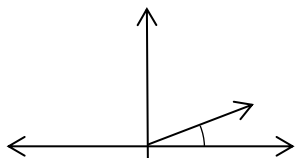
“A mathematician is a machine for turning coffee into theorems.”

May 25, 2019

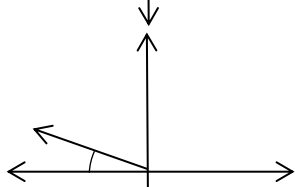
## 15 Problems Concerning Reference Angles (Part 2 of 2)

(Part 4)

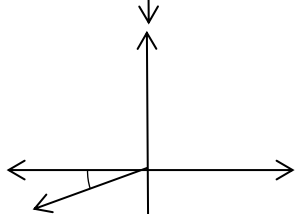
13. Reference angle  $\frac{\pi}{6}$ :



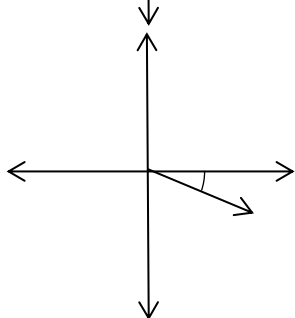
The angle in the first quadrant is the most direct to calculate: it is the same as the reference angle,  $\frac{\pi}{6}$ .



The angle in the second quadrant is calculated by  $\pi - \frac{\pi}{6} = \frac{5\pi}{6}$ .

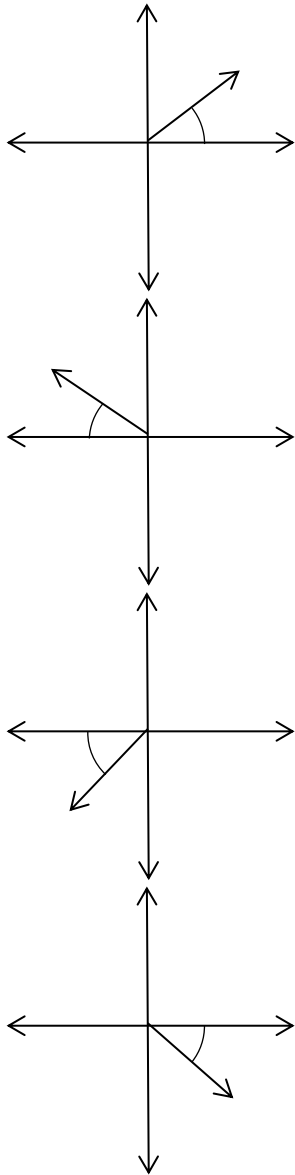


The angle in the third quadrant is calculated by  $\pi + \frac{\pi}{6} = \frac{7\pi}{6}$ .



The angle in the fourth quadrant is calculated by  $2\pi - \frac{\pi}{6} = \frac{11\pi}{6}$ .

15. Reference angle  $\frac{\pi}{4}$ :



The angle in the first quadrant is the most direct to calculate: it is the same as the reference angle,  $\frac{\pi}{4}$ .

The angle in the second quadrant is calculated by  $\pi - \frac{\pi}{4} = \frac{3\pi}{4}$ .

The angle in the third quadrant is calculated by  $\pi + \frac{\pi}{4} = \frac{5\pi}{4}$ .

The angle in the fourth quadrant is calculated by  $2\pi - \frac{\pi}{4} = \frac{7\pi}{4}$ .

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“Only he who never plays, never loses.”