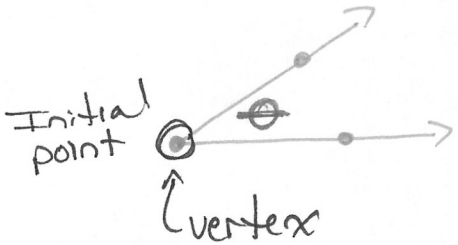
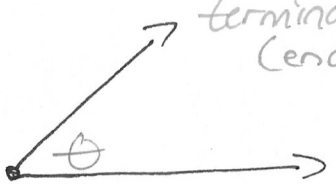
Angle Basics

Def angle: two rays that have a common initial point



θ = theta
use to symbolize ∠ measure



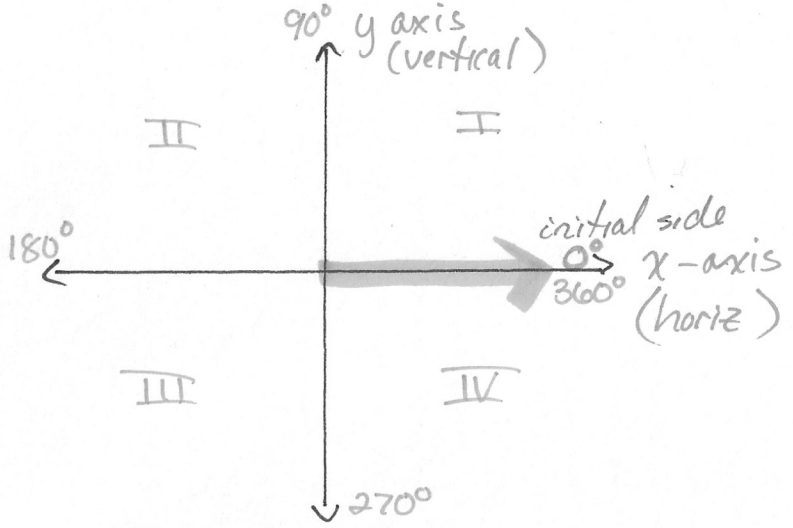
moving side

terminal side (ending side)

initial side (starting side)

stationary side

Coordinate plane: created by x & y axis



Standard position: when the initial side of the ∠ is on the positive x-axis

Directions of angles:

- counter clockwise: positive rotation (up to the left)
- clockwise: negative rotation (down to the left)

Types of Angles

Quadrantals: angles whose terminal side lands on an axis

$0°, 90°, 180°, 270°, 360°$

Coterminal angles: angles with same terminal side, but a different # of rotations

To find a coterminal:

add $360°$

subtract $360°$

ex:

	coterm
$40°$	$400°$ (+360)
	$-320°$ (−360)

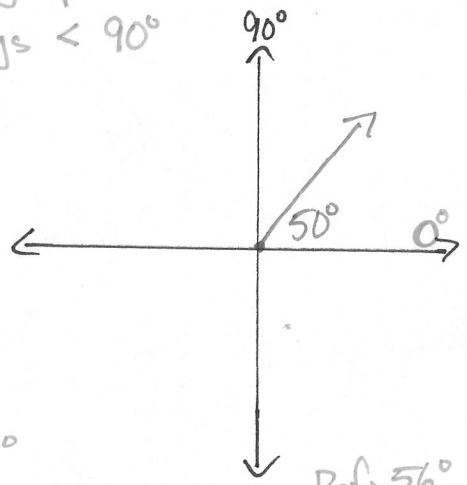
both are coterminals

*Range for our angles

$0° \leq \theta \leq 360°$

Reference ∠: refers to the distance the terminal side is from the closest x-axis

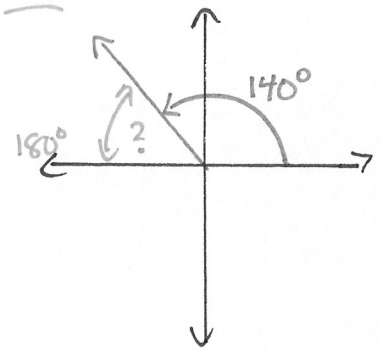
- always positive
- always $< 90°$



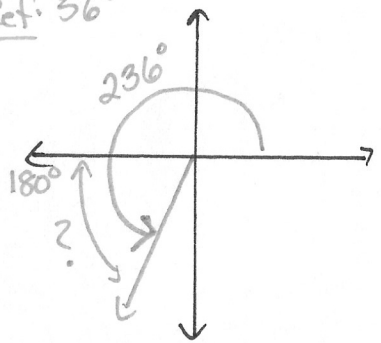
Ref ∠: $50°$

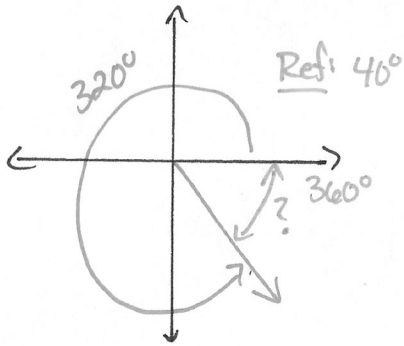
* Quadrantals do not have reference ∠

Ref: $40°$



Ref: $56°$





Ref ∠:

	Given	Ref
I	θ	θ
II	θ	$180 - \theta$
III	θ	$\theta - 180$
IV	θ	$360 - \theta$

Given	Quad	Ref	
$36°$	I	$36°$	
$217°$	III	$37°$	$217 - 180$
$270°$	y-axis	—	
$1036°/316°$	IV	$44°$	$360 - 316$

$1036 - 360 = 676$

$676 - 360 = 316$

$-416/304°$	IV	$56°$	$360 - 304$

$-416 + 360 = -56$

$-56 + 360 = 304$

DMS $\leftrightarrow$ Decimal

$40° 16'$

$35° 27' 24''$

° Degree

' minute

'' second