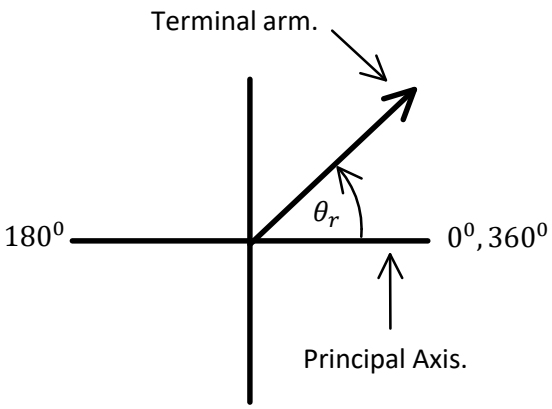
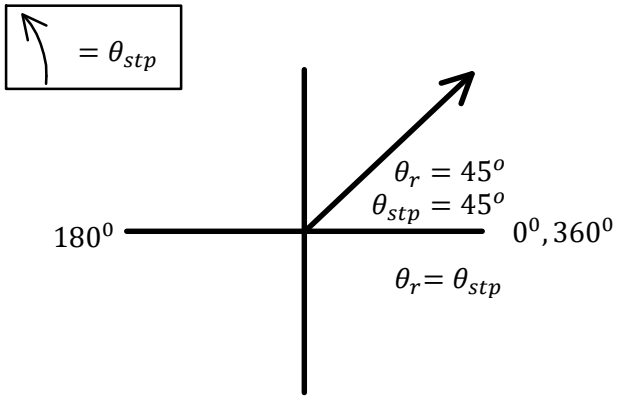
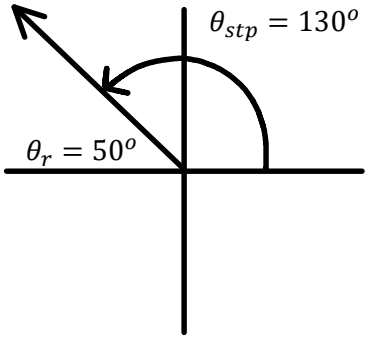
C11 - 2.1 - θ_r, θ_{stp} Notes

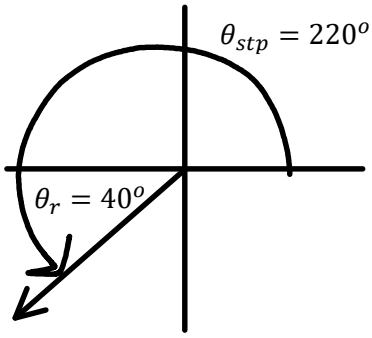
θ_r: the "reference angle"is the angle between the terminal arm and the x-axis ($0^o \leq \theta \leq 90^o$).

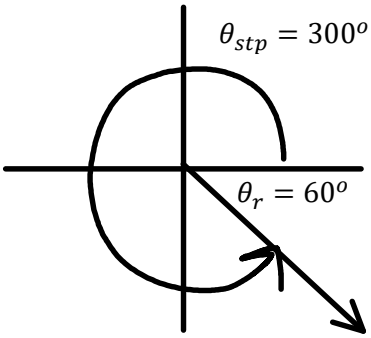
θ_{stp}: the "angle in standard position" from the principal axis (+ x-axis) to the terminal arm.











$\theta_{stp} = 180^O - 50^o$

$\theta_{stp} = 130^O$

$\theta_r = 180^O - 130^o$

$\theta_r = 50^O$

$\theta_{stp} = 180^O + 40^o$

$\theta_{stp} = 220^O$

$\theta_r = 220^o - 180^O$

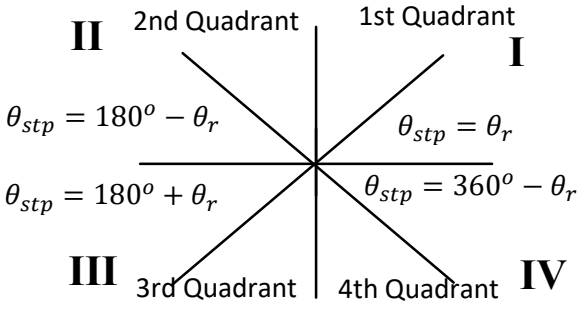
$\theta_r = 40^O$

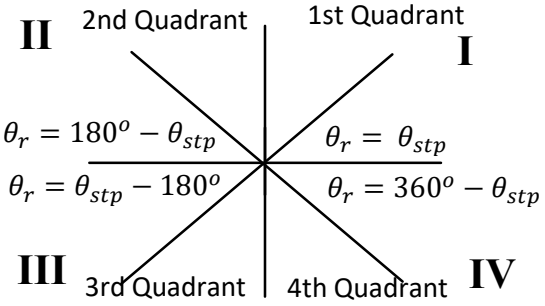
$\theta_{stp} = 360^O - 60^o$

$\theta_{stp} = 300^O$

$\theta_r = 360^O - 300^o$

$\theta_r = 60^O$

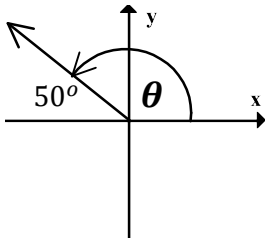




Basic logic will calculate θ_{stp} *and* θ_r much more easily than using these formulas.

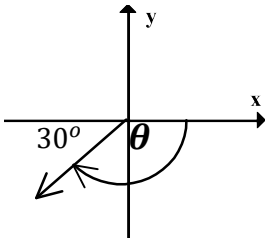
C11 - 2.1 - $\pm\,\theta_{stp}, \theta_{cot}, \theta_{pri}$ Notes

Counter-clockwise rotation is a positive θ_{stp}



$\theta_{stp} = 180^o - 50^o$
$\theta_{stp} = 130^o$

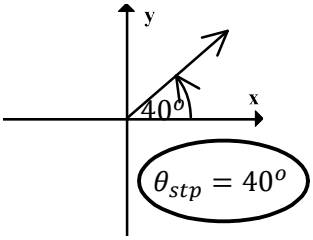
Clockwise rotation is a negative θ_{stp}



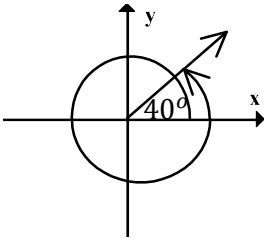
$\theta_{stp} = -(180^o - 30^o)$
$\theta_{stp} = -150^o$

Positive Co-terminal Angles (θ_{cot})

$$\theta_{cot} = \theta_{stp} \pm 360^o$$



$\theta_{stp} = 40^o$

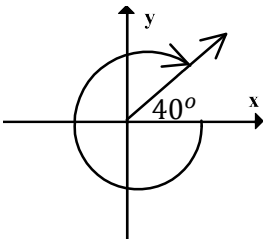


$\theta_{cot} = \theta_{stp} \pm 360^o$
$\theta_{cot} = 40^o + 360^o$
$\theta_{cot} = 400^o$

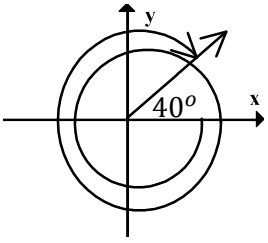
$\theta_{stp} = 40^o, \theta_{stp} = 400^o$

$\theta_{\text{cot}} = 40^o, 400^o, 760^o, 1120^o, 1480^o, \ldots$

Negative Co-terminal Angles (θ_{cot})



$\theta_{cot} = \theta_{stp} \pm 360$
$\theta_{cot} = 40 - 360$
$\theta_{cot} = -320^o$



$\theta_{cot} = \theta_{stp} \pm 360$
$\theta_{cot} = -320 - 360$
$\theta_{cot} = -680^o$

$\theta_{\text{cot}} = 40^o, -320^o, -680^o, -1040^o, -1400^o, \ldots$

$\theta_{principle} = smallest + ve\ \theta_{stp}\ coterminal.$

$\theta_{stp} = 1000^0$

$\theta_{pri} = 1000^0 - 360^0 = 640^0$
$= 640^0 - 360^0 = 280^0$

OR

$\theta_{pri} = 0 \le \theta_{cot} < 360$

$1000^0 - 2(360^0) = 280^0$

$\frac{1000^0}{360^0} = 2.777\ldots$ OR

$0.777\ldots \times 360^0 = 280^0$

You may need to add or subtract 360^0 more than once.