More on Limaçons!

what about ....

Mode – → Normal → Radian → Pol

$r = 5 - 4\cos\theta$

$a = 5$ "a" bigger – limaçon – no loop

$b = 4$

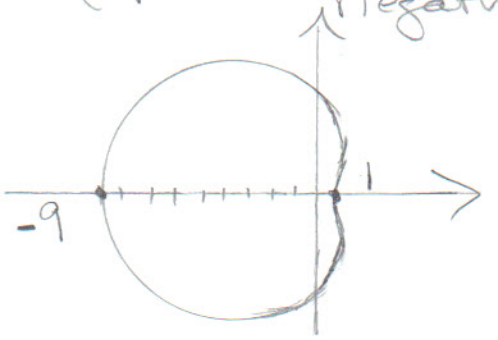
(different) cosine along polar axis

negative ⇒ negative polar axis!

$b + a = 4 + 5 = 9$ negative

$b - a = 4 - 5 = -1 \Rightarrow$

dimple on other side of vertical axis dimple at 1



$r = 3 + 5\sin\theta$

$a = 3$ "b" bigger → limaçon w/ loop

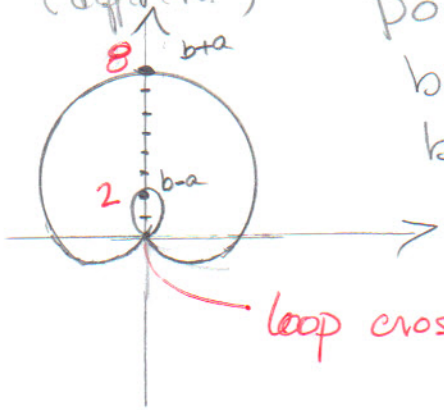
$b = 5$

(different) sine · along $\frac{\pi}{2}$ axis

positive → positive axis

$b + a = 5 + 3 = 8$

$b - a = 5 - 3 = 2$ – inside of loop



loop crosses here at (0,0)

$r = 2 - 4\sin\theta$

$a = 2$ "b" bigger → limaçon w/ loop

$b = 4$

(different) negative sine ⇒ limaçon on $-\frac{\pi}{2}$ axis

$b + a = 4 + 2 = 6$ → negative orientation

$b - a = 4 - 2 = 2$

★ negative orientation ∴ −6

★ negative orientation at −2