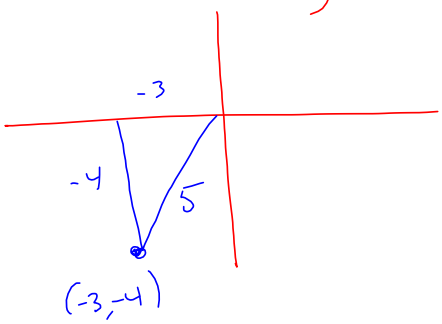
$(r,\theta) \longleftrightarrow (x,y)$

$r = \sqrt{x^2+y^2}$

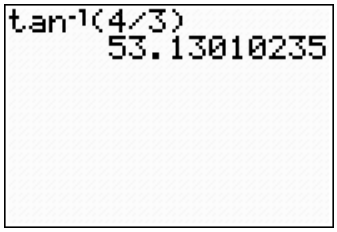
$\tan\theta = \frac{y}{x}$ I'll probably give you a point in QII or QIII, so $\arctan(\frac{y}{x})$ needs interpreting

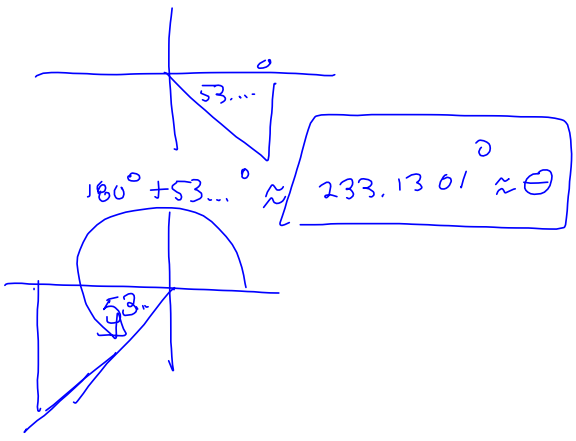


$\sqrt{x^2+y^2} = \sqrt{3^2+4^2} = \sqrt{25} = \boxed{5} = r$

$\tan\theta = \frac{-4}{-3} = \frac{4}{3}$

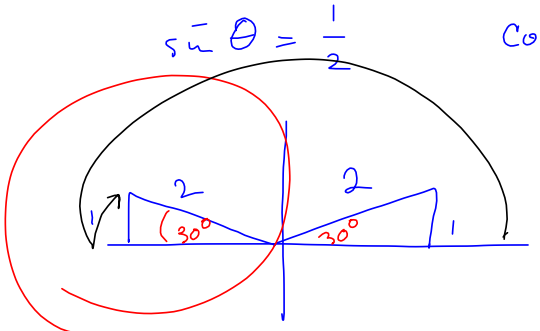
$\arctan(\frac{4}{3}) \approx 53.13010235^\circ$





$(r,\theta) \approx (5, 233.1301^\circ)$

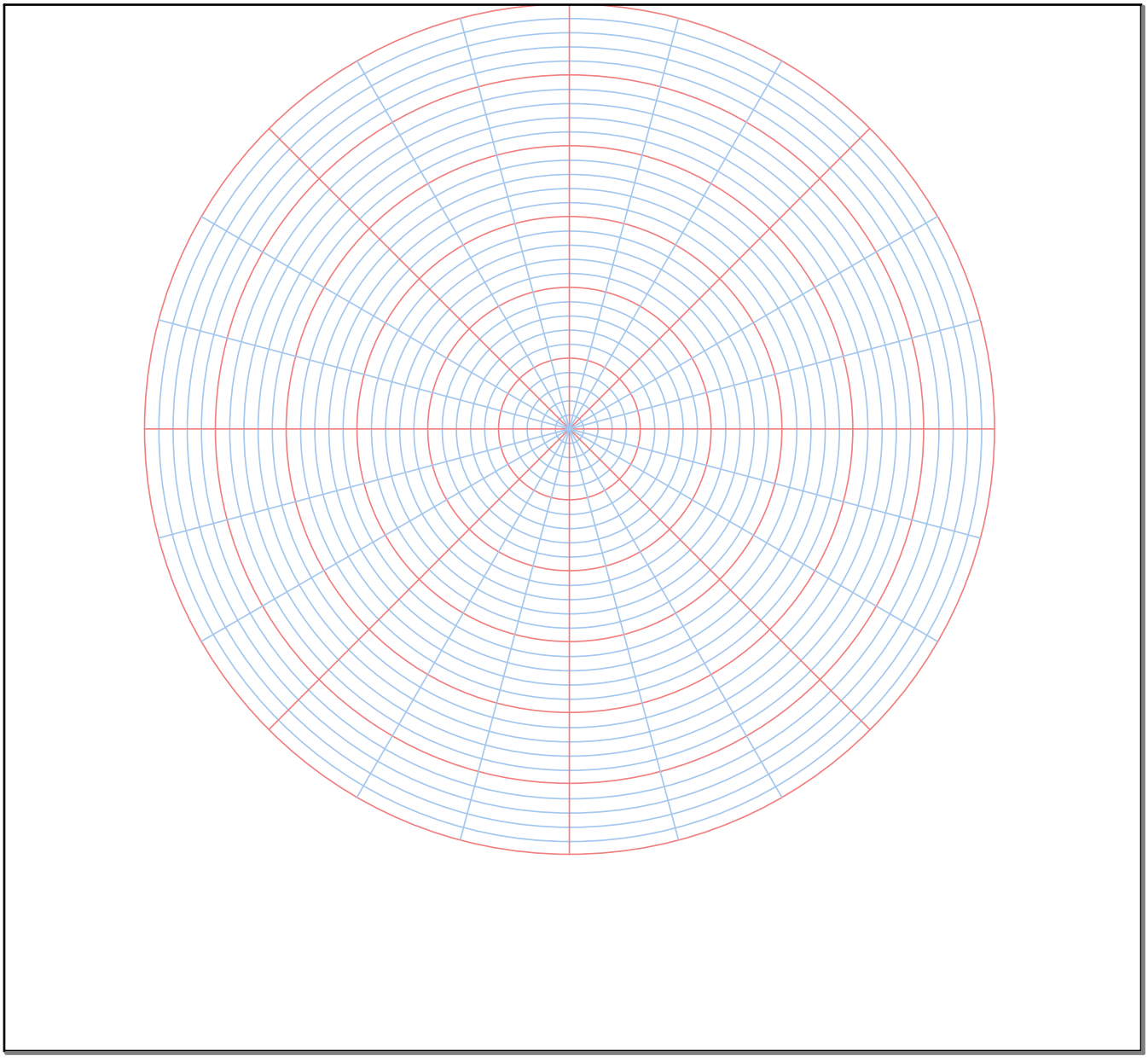
$\sin\theta = \frac{1}{2}$ $\cos\theta < 0$

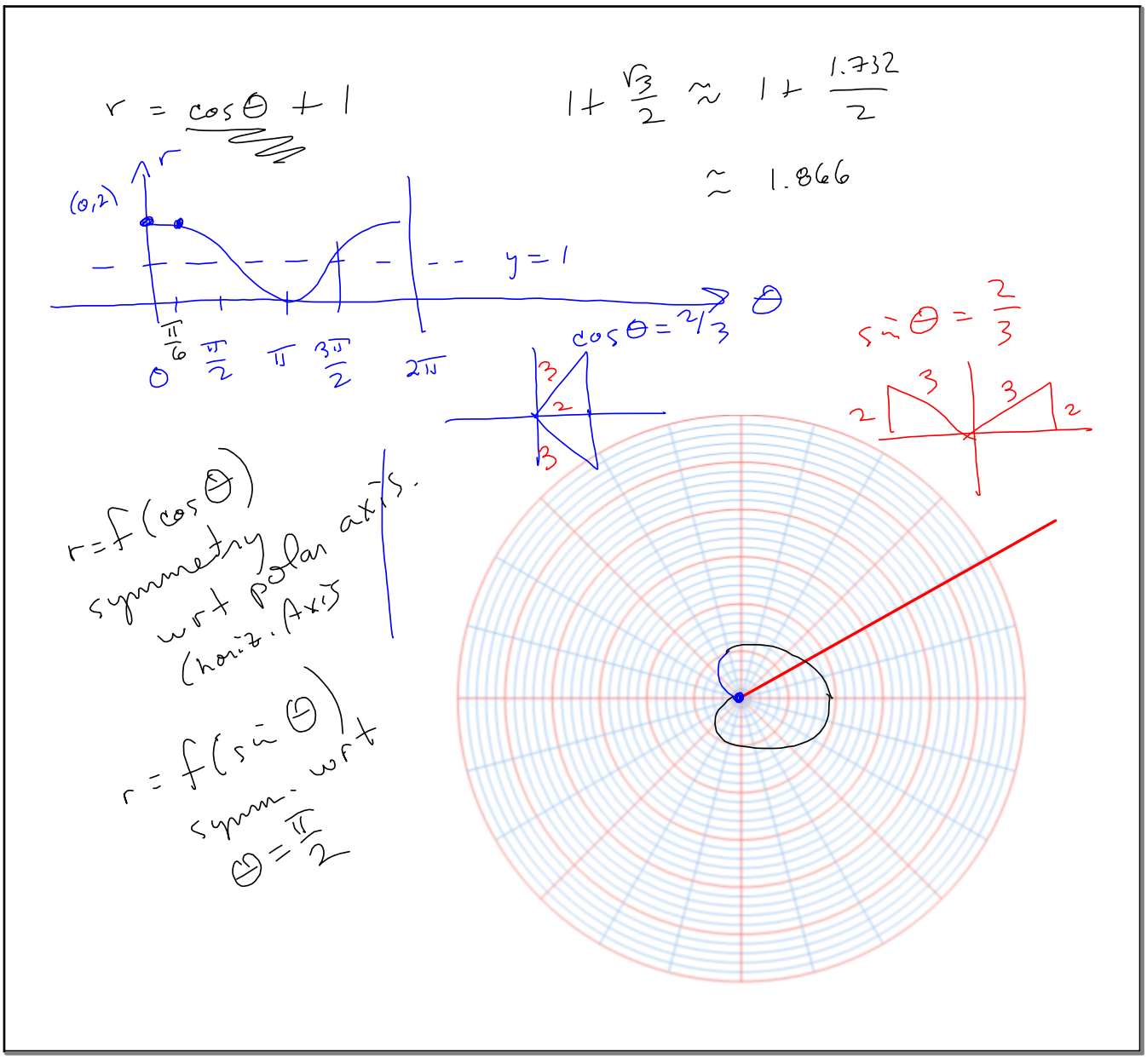


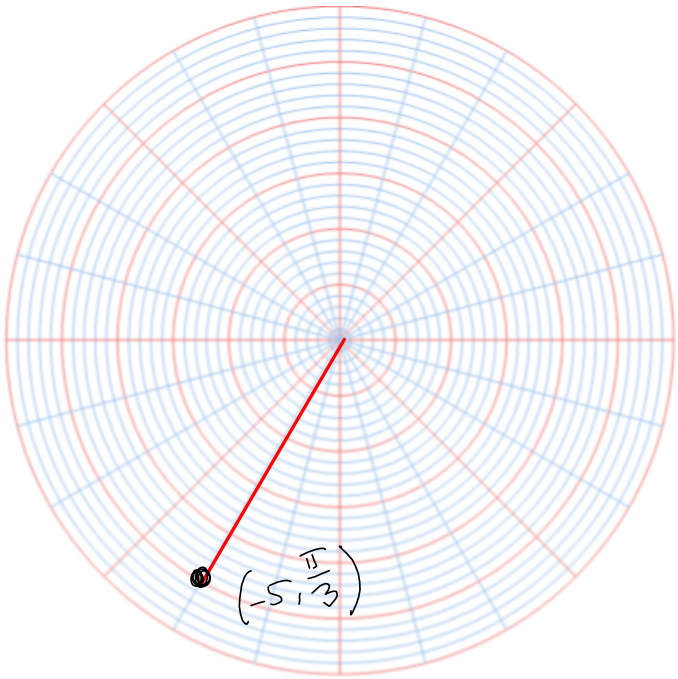
Calculator will say 30°, which is wrong.

This is the one!

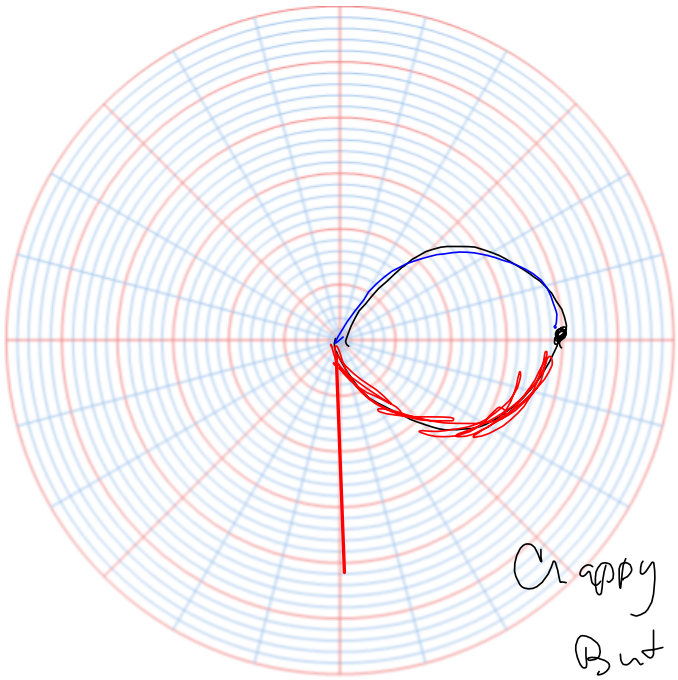
$\theta = 180^\circ - 30^\circ = 150^\circ = \theta$



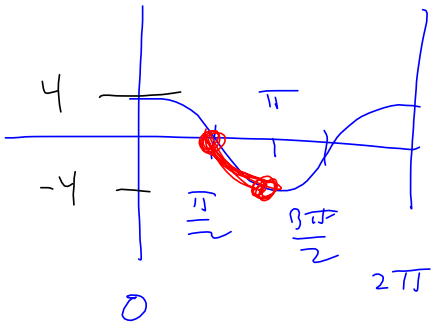

r = cos θ + 1
1 + √3/2 ≈ 1 + 1.732/2
≈ 1.866
r
(0,2)
y = 1
θ
π/6
π/2
π
3π/2
2π
cos θ = 2/3
3
2
3
sin θ = 2/3
2
3
3
2
r = f(cos θ)
symmetry wrt polar axis.
(horiz. axis)
r = f(sin θ)
symm. wrt
θ = π/2



$(-5, \frac{\pi}{3})$



$r = 4\cos\theta$



Crappy Circle.
But it IS a circle!
Goes twice around it
as θ goes from 0 to 2π.