

THE LAST MATH 21B DISCUSSION WORKSHEET :(

I KNOW, I'M SAD ABOUT IT TOO.

Problem 1. Find the area of the surface obtained by rotating the curve

$$x = \tan^2(t), \quad y = 2 \tan(t), \quad 0 \leq t \leq \frac{\pi}{4}$$

about the x -axis.

Problem 2. Consider the parametric equations

$$x = 2\theta, \quad y = 2 \ln(\cos(\theta)).$$

Find the length of the curve from $\theta = 0$ to $\theta = \frac{\pi}{4}$.

Problem 3. Find the area of the surface obtained by rotating the curve

$$x = 5 \cos(t) + 5t \sin(t), \quad y = 5 \sin(t) - 5t \cos(t), \quad 0 \leq t \leq \frac{\pi}{2}$$

about the y -axis.

Problem 4. Match the Cartesian coordinates in the left column with the Polar coordinates in the right column. **WARNING: Each column contains a point without any match in the other column!**

(A)	(2, 0)	(α)	$\left(5\sqrt{2}, \frac{67\pi}{4}\right)$
(B)	(-5, 5)	(β)	$\left(2, -\frac{67\pi}{3}\right)$
(C)	(0, 2)	(γ)	(1, 2)
(D)	$(1, -\sqrt{3})$	(δ)	$\left(-2, \frac{67\pi}{2}\right)$
(E)	$(-1, \sqrt{3})$	(ϵ)	(2, 0)
(F)	(cos(2), sin(2))	(ζ)	$(\sqrt{5}, \arctan(2))$
(G)	(1, 2)	(η)	(0, 2)
(H)	(0, 0)	(ι)	$\left(-2, \frac{67\pi}{6}\right)$