

MATH 53 DISCUSSION SECTION PROBLEMS – 1/26/23

1. AREAS AND LENGTHS IN POLAR COORDINATES

- (1) (**textbook 10.4.7**) Find the area of the region which is inside the curve $r = 4 + 3 \sin \theta$ and to the right of the y -axis.
- (2) (**textbook 10.4.19**) Find the area of the region enclosed by one loop of the curve $r = \sin 4\theta$.
- (3) (**textbook 10.4.31**) Find the area of the region that lies inside both of the curves $r = \sin 2\theta$ and $r = \cos 2\theta$.
- (4) (**textbook 10.4.45**) Find the exact length of the polar curve $r = 2 \cos \theta$, $0 \leq \theta \leq \pi$.

2. NOTES

All problems labeled “textbook” come from Stewart, James, *Multivariable Calculus: Math 53 at UC Berkeley*, 8th Edition, Cengage Learning, 2016.

Problems marked (*) are challenge problems, with problems marked (**) especially challenging problems.