

Show all work to receive full credit.

1. (5 points)(Section 10.4, Number 43, variation:)

(a) Sketch the cartesian curve
 $y = \sin(2x)$ for $0 \leq x \leq 2\pi$.

(b) Now sketch the polar curve
 $r = \sin(2\theta)$ for $0 \leq \theta \leq 2\pi$.

2. (5 points)(Section 10.5, Number 17:) Find the area of the region enclosed by **one loop** of the polar curve

$$r = \sin(2\theta).$$

If you were unable to find a correct sketch of the curve in the previous question, find the area over the interval $0 \leq \theta \leq \pi$.

3. (Two Points Extra Credit, Section 10.4, Number 51:). Show that the polar curve $r = 4 + \sec \theta$ has the line $x = 2$ as a vertical asymptote by showing that $\lim_{r \rightarrow \pm\infty} x = 2$. (Use the back of this sheet).