Math 2300 **Name:** _____
Spring 2026
Quiz 7

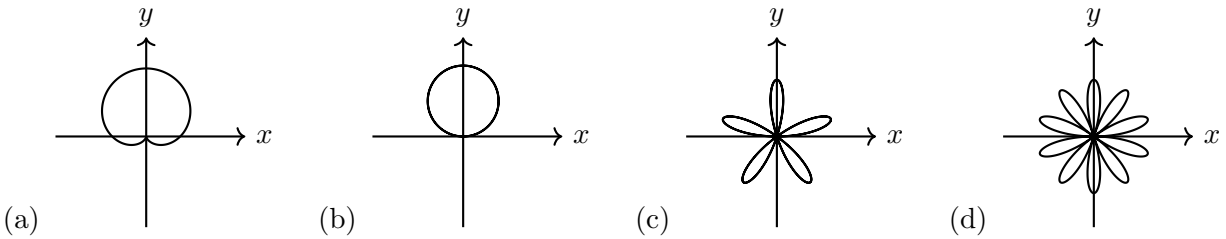
1. (2 points) Consider the parametric curve

$$x = \frac{1}{2}t^2, \qquad y = \sqrt{t}, \qquad 0 \le t \le 6.$$

What is the equation of the line tangent to the curve at the point $(8, 2)$?

(a) $y = \frac{1}{4}x$
(b) $y = \frac{1}{8}x + 1$
(c) $y = -\frac{1}{16}x + \frac{5}{2}$
(d) $y = 16x + 2$
(e) $y = \frac{1}{16}x + \frac{3}{2}$

2. (2 points) Which of the following graphs represents the polar function $r = \sin(5\theta)$?



(a) (b) (c) (d)

3. (2 points) Set up an integral for the arc length of the parametric curve given by

$$\begin{cases} x(t) = \sin(t), \\ y(t) = t^3, \end{cases} \qquad 0 \le t \le 2\pi.$$

You **do not** have to compute the integral.

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4. (4 points) **Set up, but do not evaluate**, an integral that computes the area of the region that lies inside the graph of $r = 4$ and outside the graph of $r = 3 + 2\sin\theta$.