MATH 202, Fall 2023	}
Exam 4 Practice	

Name:	
Row and Seat:	

"If people sat outside and looked at the stars each night, I'll bet they'd live a lot differently." Calvin (Bill Waterson)

1. For the parametricaly defined curve  $\begin{cases} x = 3t \\ y = 9t^2 + t \end{cases} - \infty < t < \infty$ , eliminate the parameter t. Sketch the resulting curve in the xy cartesian coordinate system.

2. For the parametricaly defined curve  $\begin{cases} x = 3\cos(t) \\ y = 9\sin(t) \end{cases}$  0 \le t \le 2\pi, eliminate the parameter *t*. Sketch the resulting curve in the *xy* cartesian coordinate sytem.

3. For the curve  $x^3 + y^3 - 3xy = 48$ , find the numerical value of  $\frac{dy}{dx}\Big|_{x=2,y=4}$ 

- 4. For the parametrically defined curve  $\begin{cases} x = -\sqrt{1+t} \\ y = \sqrt{3t} \end{cases}$  0 \le t < \infty, \text{ find the numerical values of } \frac{dy}{dx} \Big|\_{t=3} \text{ and } \frac{d^2y}{dx^2} \Big|\_{t=3}.

5.	Represent the arc length of the polar curve $r = a(1 - \sin(\theta))$ as a definite integral
	Here a is a positive real number.

6. Find all points on the polar curve  $r = 3 - 2\sin(\theta)$  that have a horizontal tangent line.

7. Find area of the region bounded by the polar curve $r = 3 - 2\sin(\theta)$	7.	7. Find	area	of the r	egion l	bounded	by the	polar	curve <i>r</i>	· = 3 -	$2\sin(\theta)$
---	----	---------	------	----------	---------	---------	--------	-------	----------------	---------	-----------------

8. Find the area bounded by the polar curve  $r = \cos(4\theta)$