Exam 4 **Name**_____

Math 132-01 **Calculus II** **November 30, 2018**

Guidelines

- **Calculators are not allowed.**
- Read the questions carefully. You have 65 minutes; use your time wisely.
- You may leave your answers in symbolic form, like $\sqrt{3}$ or $\ln(2)$, unless they simplify further like $\sqrt{9} = 3$ or $\cos(3\pi/4) = -\sqrt{2}/2$.
- Put a box around your final answers when relevant.
- Show all steps in your solutions and make your reasoning clear. Answers with no explanation will not receive full credit, even when correct.
- Use the space provided. If necessary, write "see other side" and continue working on the back of the same page.

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1. (8 points) To be completed once exams are graded and returned. Please correct any problem with points deducted. All corrections should be completed neatly on a separate sheet of paper. Once you have finished your corrections, take your exam and corrections to the Office of Student Learning (OSL), and a tutor will check your answers and sign below. The checked solutions should be given to your instructor.

   Signature: _____
   Print Name: _____
   Date: _____

2. For the point with rectangular coordinates $(-1, \sqrt{3})$, find polar coordinates with

   a. (3 points) $r > 0$ and $0 \leq \theta < 2\pi$;

   b. (3 points) $r < 0$ and $0 \leq \theta < 2\pi$.

3. (8 points) Convert the polar equation $r = 2\cos\theta - 6\sin\theta$ to rectangular coordinates and describe the curve it represents.

4. (8 points) Sketch the polar curve $r = \frac{1}{2} - \sin\theta$.

5. (8 points) Set up, but do not evaluate, an integral representing the area enclosed by the inner loop of $r = \frac{1}{2} - \sin\theta$.

6. Consider the parametric equations $x = e^t$, $y = 3e^{-2t}$ for $0 \leq t \leq \ln 3$.

   a. (6 points) Eliminate the parameter to obtain an equation in x and y.

   b. (4 points) Sketch the curve.

7. Write each complex number in the form $x + yi$.

   a. (4 points) i^{77}

   b. (4 points) $\dfrac{2-3i}{-1+5i}$

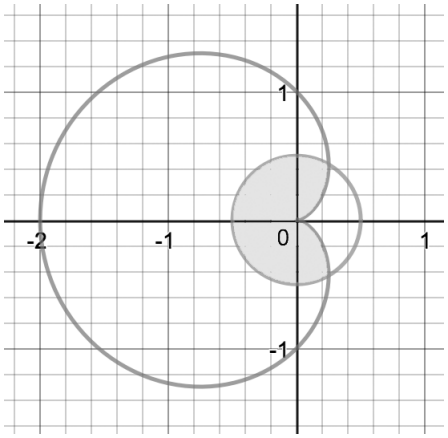
8. (8 points) Find the point (x, y) where the tangent line to the parametric curve $x = t^2 - 9$, $y = t^2 - 8t$ is horizontal.

9. (8 points) Find an equation of the tangent line to the polar curve $r = 8\sin\theta$ at $\theta = \dfrac{5\pi}{6}$.

10. (8 points) Write $(-1 + i)^8$ in the form $x + yi$ without expanding.

11. (8 points) Find all complex cube roots of -27.

12. (12 points) Calculate the area inside both the cardioid $r = 1 - \cos\theta$ and the circle $r = \frac{1}{2}$.



Question	Points	Score
1	8	
2	6	
3	8	
4	8	
5	8	
6	10	
7	8	
8	8	
9	8	
10	8	
11	8	
12	12	
Total:	100	