

**MAT 271 – Calculus II**  
**Sample Test 3 Part 2 In-class exam**  
**Instructor: Rafael Pacheco**

NAME: \_\_\_\_\_

ASU ID # \_\_\_\_\_ Section No. \_\_\_\_\_

**Note:** All work to be shown on the pages provided for **full credit**, use reverse side if necessary. No books or notes of any kind are permitted.

1. If  $r = \sin 3\theta$ , sketch the curve and find the area that it encloses (30 points).
  
2. If  $r = 2^\theta$ ,  $0 \leq \theta \leq 2\pi$ , find the length of the polar curve (30 points).
  
3. Find an equation for the conic that satisfies the given conditions (10 points each):
  - Parabola, vertex  $(0, 0)$ , focus  $(0, -2)$ .
  - Ellipse, foci  $(\pm 2, 0)$ , vertices  $(\pm 5, 0)$ .
  - Hyperbola, foci  $(0, \pm 3)$ , vertices  $(0, \pm 1)$ .