

Name: \_\_\_\_\_

Section: 100

*Please complete the following exercises. Please answer individually (no collaboration).*

1. Write each number in polar form,  $z = re^{\theta i}$ :

(a)  $-\sqrt{3} + i$

(b)  $4 - 4i$

2. Write each number in standard form,  $z = x + iy$ :

(a)  $7e^{\pi i/4}$

(b)  $2e^{7\pi i/6}$

3. Remind yourself using a calculator, or by drawing a diagram, or by some other means, of what  $e^{\pi i}$  is. Does this now make more sense than it did last time we saw it?

4. Describe the region in the complex plane with  $z$  such that  $1 \leq |z| < 2$  and  $0 < \text{Arg}(z) < \pi/3$ . Sketch a picture, but also describe in a few words as necessary.

5. Find the roots indicated

(a)  $(1 + i)^{1/2}$

(b)  $(-8 - 8\sqrt{3}i)^{1/4}$