NAME _____ DATE _____ PERIOD _____

Practice

Powers and Roots of Complex Numbers

Find each power. Express the result in rectangular form.

1. $(-2 - 2\sqrt{3}\boldsymbol{i})^3$

2. $(1 - \boldsymbol{i})^5$

3. $(-1 + \sqrt{3}\boldsymbol{i})^{12}$

4. $\left[1\left(\cos \frac{\pi}{4} + \boldsymbol{i} \sin \frac{\pi}{4}\right)\right]^{-3}$

5. $(2 + 3\boldsymbol{i})^6$

6. $(1 + \boldsymbol{i})^8$

Find each principal root. Express the result in the form a + bi with a and b rounded to the nearest hundredth.

7. $(-27\boldsymbol{i})^{\frac{1}{3}}$

8. $(8 - 8\boldsymbol{i})^{\frac{1}{3}}$

9. $\sqrt[5]{-243\boldsymbol{i}}$

10. $(-\boldsymbol{i})^{\frac{1}{3}}$

11. $\sqrt[8]{-8\boldsymbol{i}}$

12. $\sqrt[4]{-2 - 2\sqrt{3}\boldsymbol{i}}$

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