

Show all your work for full credit. Unsupported answers = reduced points. Use extra paper if necessary.

1. Let $z_1 = -5 + 5i$ and $z_2 = 4 - 4\sqrt{3}i$. Find the trigonometric form for each complex number

[/2]

2. Using the polar form of the numbers in problem (1), find the following. Write answers in polar form and in rectangular form rounded to two decimal places:

a) $z_1 \cdot z_2$

[/2]

b) $\frac{z_1}{z_2}$

[/2]

3. Find the four 4th-roots of -16 . Write answer in polar form and in rectangular form.

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4. Use Demoivre's formula to help find all the solutions to the equation $x^3 + 27i = 0$

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5. A barge is being pulled by two tugs, one with a force of 5000 Newtons, and a second with a force of 3500 Newtons separated by an angle of 38° . Find the resultant force acting on the barge, and the direction of the barge relative to the 3500 Newton force (i.e., the angle between the resultant force on the 3500 N force).

[/2.5]

6. A 200 pound chandelier is being supported by two chains. The left chain has an angle of depression of 50° , and the right chain has an angle of depression of 35° . Find the tension on each chain.

[/2.5]
