Name: _____

Operations with Complex Numbers

1) Use the trigonometric form to find each of the following products and quotients, and express the result in the form of a + bi:

   1) $(1+i)(\sqrt{2}-i\sqrt{2})$

   2) $(1+i)(3-3i)$

   3) $(1+i)(3-i)$

   4) $(1+2i)(4-3i)$

   5) $(i+3)(-2-i)$

   6) $(2i-5)(-3-i)$

   7) $(-1-i\sqrt{3})(-4\sqrt{3}+4i)$

   8) $(-1-i)(-2-3i)$

   9) $\dfrac{4+4\sqrt{3}i}{\sqrt{3}+i}$

   10) $\dfrac{1-i}{1+i}$

   11) $\dfrac{3+i}{2+i}$

   12) $\dfrac{1-2i}{4+3i}$

2) Perform the operation and leave the result in the trigonometric form

$$\frac{6(\cos 40^0 + i\sin 40^0)}{7(\cos 100^0 + i\sin 100^0)}$$

3) Perform the indicated operations and write your answer in the form of a + bi:

   a) $3cis25^0 \cdot 8cis200^0$

   b) $4cis50^0 \cdot 2cis100^0$

   c) $\dfrac{4cis190^0}{2cis70^0}$

   d) $\dfrac{12cis200^0}{3cis350^0}$

4) Perform: $\dfrac{(\sqrt{3}-i)^{-1}}{(\sqrt{3}+i)^{-1}}$. Write your answer in standard form.

5) Find the product of $z_1 = 1+i\sqrt{3}$ and $z_2 = -\sqrt{3}+i$ in trigonometric form

6) Divide $z_1 = 1+i\sqrt{3}$ by $z_2 = \sqrt{3}+i$ and write the answer in standard form