MT-A141 Precalculus Worksheet 8.4

Group: _____ Present: _____

1. Compute the following (put in the form $a + bi$)

(a) $(2 - 3i) + (5 + 4i) =$ _____

(b) $(7 + 4i) - (2 - 3i) =$ _____

(c) $(2 - 3i)(5 + 4i) =$ _____ $=$ _____

(d) $\frac{7+4i}{2-3i} = \frac{7+4i}{2-3i} \cdot$ _____ $=$ _____ $=$ _____

2. Convert $z_1 = -1 + \sqrt{3}i$ and $z_2 = 3 - 3i$ to trigonometric form:

Moduli: $r_1 =$ _____ and $r_1 =$ _____

Arguments: $\theta_1 =$ _____ and $\theta_1 =$ _____

(You may wish to draw some appropriate triangles to help find these values exactly)

Thus $z_1 = -1 + \sqrt{3}i =$ ____(cos(____) + i sin(____))

and $z_2 = 3 - 3i =$ ____(cos(____) + i sin(____))

Now let's compute the product and quotient of z_1 and z_2 using trigonometric form:

$(-1 + \sqrt{3}i)(3 - 3i) =$ (____(cos(____) + i sin(____)))(____(cos(____) + i sin(____)))

$=$ _____(cos(_____) + i sin(_____))

$=$ ____(cos(____) + i sin(____))

$=$ ____ cos(____) + i____ sin(____) (convert to $a + bi$ form)

$=$ ____ + ____i

and

$\frac{-1+\sqrt{3}i}{3-3i} = \frac{\text{\_\_\_\_(cos(\_\_\_\_)+i sin(\_\_\_\_))}}{\text{\_\_\_\_(cos(\_\_\_\_)+i sin(\_\_\_\_))}}$

$=$ _____(cos(_____) + i sin(_____))

$=$ ____(cos(____) + i sin(____))

$=$ ____ cos(____) + i____ sin(____) (convert to $a + bi$ form)

$=$ ____ + ____i