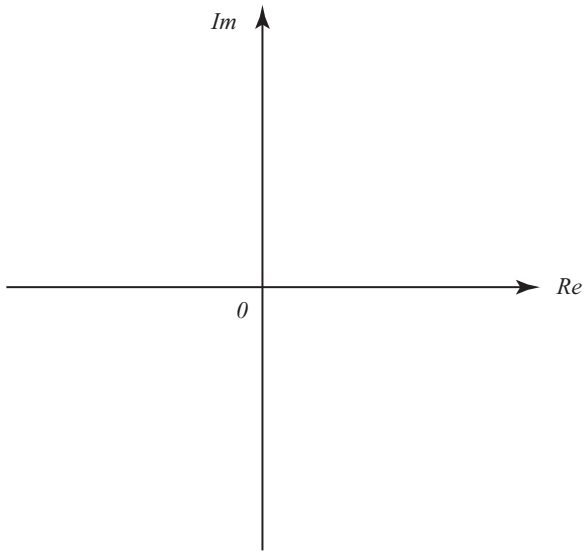
Math 20480 Exercise 03 Name _____

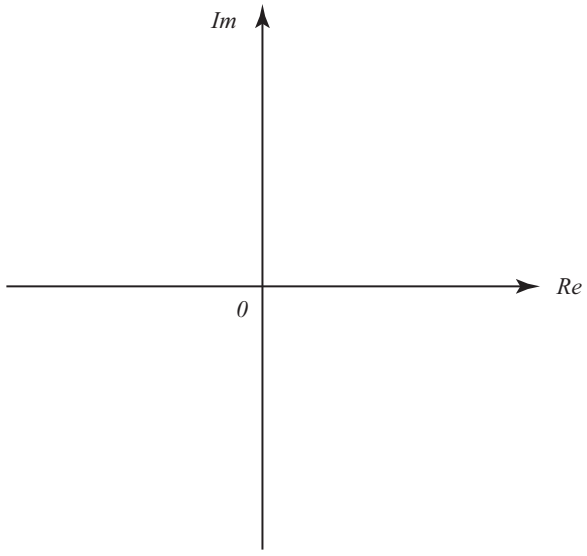
1. For each complex numbers below find its modulus and argument ($0 \leq \theta \leq 2\pi$). Draw the complex number in the Argand plane provided indicating its modulus and argument.

1a. $z_1 = 1 - i$.



Modulus of z_1 is _____ Argument of z_1 is _____

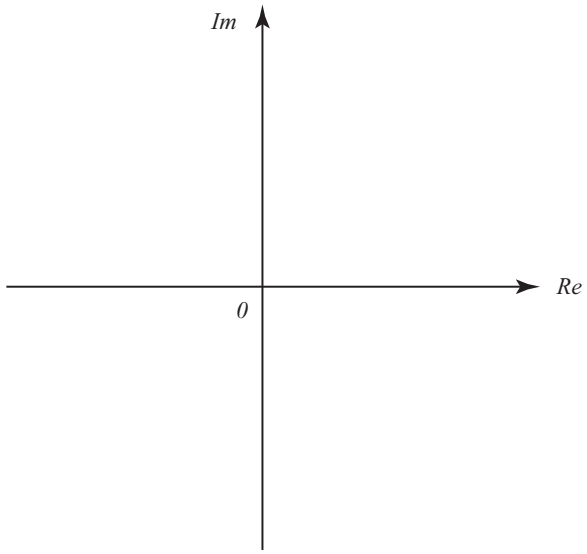
1b. $z_2 = \sqrt{3} + i$.



Modulus of z_2 is _____ Argument of z_2 is _____

Math 20480 Exercise 03 Name _____

1c. (Continue...) $z_3 = -2 - 2\sqrt{3}i$.



Modulus of z_3 is _____ Argument of z_3 is _____

2. Referring to Q1 above, write each complex numbers z_1, z_2, and z_3 and its conjugate in both polar form $r(\cos\theta + i\sin\theta)$ and in the form $re^{i\theta}$.

$z_1 =$ _____ $\overline{z_1} =$ _____

$=$ _____ $=$ _____

$z_2 =$ _____ $\overline{z_2} =$ _____

$=$ _____ $=$ _____

$z_3 =$ _____ $\overline{z_3} =$ _____

$=$ _____ $=$ _____

3. Evaluate the following powers of a complex numbers. Give your answer in the form $a+bi$. You must give the value of a and b exactly.

3a. $\left(\sqrt{3}+i\right)^{41}$

3b. $\left(\dfrac{-1+3i}{1+2i}\right)^{57}$